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ABSTRACT

This study of periodical interlibrary loan in New Jersey focuses on access to and sharing of periodical information in the state-wide library networks and investigates the feasibility of providing online search services for such information. The three part study began with a survey of the library literature dealing with networking and an examination of the library network plans of 13 states including New Jersey. A chart comparing aspects of nine state plans and a summary and evaluation of individual state plans are included. The second part of the study involved data gathering in ten libraries in the New Brunswick area for the availability of periodicals and for periodical article interlibrary loan statistics for 1976. Percentages of interlibrary loan requests for periodical articles were examined for local public libraries, academic libraries, and two area libraries. Conclusions and recommendations from the literature search and data gathering, which are presented in the third part of the study, indicate a cost-benefit analysis of online service in area libraries, along with the collection of more complete and accurate management information for information service from periodicals. Appendices include the interview guide, photoduplication request form, and the Phase I study. (Author/CWM)

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The Feasibility of Implementing an Online Data Base Search Service in the New Jersey Library Network

Phase II

Patterns of Service in Periodical Information Requests in the Area Libraries of New Jersey

A Research Study

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Introduction

This study of periodical interlibrary loan in New Jersey is the first attempt to study access to and sharing of periodical information in the network of New Jersey libraries. The study directly addresses Goal III of Networks for Knowledge (NFK) (Library Development Committee) "Ensure that all library resources at the local, intermediate and specialized levels within the State of New Jersey are integrated as part of a coordinated network and further that these state resources be compatible and efficiently connected to the broad resources of library networks nationwide in the interests of providing every citizen of New Jersey with access to library and information materials and services." Goal II of NFK seeks to "ensure that all citizens of New Jersey have legal access to library resources somewhere within their reach to provide additional and more specialized library materials and services they want." A major resource for these additional and more specialized library materials is the network of bibliographic data bases computerized and available online through the service of commercial jobbers, OCLC, and the National Library of Medicine. The intermediate service level designated within 45 minutes travel time from the home of each New Jersey citizen is the area library. Therefore, the feasibility of online bibliographic access in New Jersey area libraries becomes the focus of this first study of patterns of service in periodical information requests.

> Access is 1) a method or device whereby a document may be found; 2) permission and opportunity to use a document. Access to (knowing about) a document is distinguished from acquisition of (obtaining) a document.

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I. SUMMARY OF PHASE I STUDY

The Information Networks Course at Rutgers Graduate School of Library Service in Fall, 1977 investigated the feasibility of implementing an on-line data base search service in the New Jersey Library Network. This student study was partially supported by the Library Development Bureau of the New Jersey State Library and is included with this report as Appendix C. The student study was written in parts, is unedited and uneven.

The study had three parts. First, the students studied the library literature dealing with networking and examined the library network plans of thirteen states including New Jersey "In an attempt to locate a suitable model to aid in the investigation of the feasibility of implementing an online data base search service in New Jersey." The students found no completely suitable model. They included a chart comparing aspects of nine state plans as Appendix 2 of their report and included a summary and evaluation of individual state plans as Appendix 3.

The second part of the student study involved data gathering in ten libraries in the New Brunswick area for the availability of periodicals and for periodical article interlibrary loan (ILL) statistics for 1976. The libraries included local public libraries, academic and university libraries, and two area libraries. The students looked at the percentages of ILL requests for periodical articles. These percentages ranged from 1% at a local public library, to 10.6% at an area library, to 56.4% at a state college library. Periodical article ILL data at the university libraries were unavailable to the students.

The third part of the student study presented conclusions and recommendations from their literature search and data gathering. The student study drew the following conclusions:

1. Should public libraries bother to provide online services:

   a. In the DIALIB study it was noted that the clients for online services came from outside the community. Their questions diverted the attention of the reference staff from within the community. Using property tax funds to help outsiders might be politically ticklish.

   b. If serious researchers and students don't think of the public library as a resource, is it worth the expense of using online data bases to change this image? College and university libraries already have the clientele and the image of being the place to conduct research. The potential users of online data bases who are usually not connected with the university networks are in the business community.

   c. Within the funding structure of the New Jersey library system there is provision to refer "third level" questions to the four Third level libraries, Rutgers, Newark, Princeton, and the State library. Online data base searches seem to represent third level questions and could be funded accordingly.

2. If the colleges and university libraries plus Newark are interested in forming a network of online data base centers there are a number of advantages:

   a. Some are already linked through a union list of serial holdings which could be made more useful through the provisions of the Eisner report. Those libraries not included in the Union List should consider providing holdings data.

   b. If the libraries that we visited are any indication of the general trend in N.J., few of the 1% sample of journals covered by data bases are to be found in local public libraries in New Jersey. Significantly more of these journals were located in the few academic libraries visited.

   c. In the California study, 46% of the documents cited were found in the college and university libraries.

   d. If the state college libraries, the private college libraries, and the existing reference libraries were interested in providing online data base service to the state of New Jersey as a third level reference network, this would provide a network of libraries across the state.

3. If the potential for public library access of online data bases should be given further consideration, a pilot study might be conducted in which an existing public library federation, a non-federated area library and a college library system all introduce online data service on an experimental basis, funded by a grant, and make competitive use studies.

   a. Librarians trained in one library could offer training to librarians in other libraries and maintain workshops to keep skills up-to-date, and trade information on new data bases.

   b. The volume and nature of ILL problems could be studied.

   c. Comparative figures on search thoroughness, etc. could be provided by using a control group of libraries not providing online service. This recommendation is being made to augment the DIALIB study and others conducted by online data base vendors.

4. Less expensive teletypewriter (telecommunications) network might be used to tie a few online terminals, located in resource centers, to public libraries throughout the state. Referral network would consist of four resource libraries (Rutgers, State Library, Princeton & Newark) plus one or two libraries in South Jersey, such as Stockton State College or Glassboro State College.

5. Online data base costs may be high, and under present economic conditions, may be too costly for most N.J. public libraries.

II. INTRODUCTION TO PHASE II STUDY

The objective of the Phase II study of the feasibility of implementing online data base search service in the New Jersey library network was to map for the State library the patterns of service in periodical information requests. Patterns of service and of periodical requests describe current practice. Without a description of current practice, recommendations for feasibility of online data base search service would only be subjective and hypothetical.

The study used interview data and bibliometric data from the 1977 photoduplication request records in 20 area libraries (Newark, Trenton and the State Library were excluded from the study.). The area library data was aggregated into the two regions of the state (Newark and the State Library region) for analysis. Each area included an equal number of area libraries and had approximately half of the state population. Table 9 (p. 24) gives the overall characteristics of each region.

Findings from the study show a need for cost-benefit analysis of online service in area libraries and a need for more complete and accurate management information for information service from periodicals. Much periodical use in New Jersey area libraries is informal and undocumented. This informal and undocumented use includes local borrowing, interlibrary loan, and requests for photocopies of a particular article.

III. RECOMMENDATIONS

Based on the findings from analysis of interview data (p. 10) and bibliometric data (p. 20) a cost-benefit study of the feasibility of online data base search services is recommended as Phase III of this Information Network Project. Phase III could be undertaken as a controlled experiment such that:

1) Online service would be funded in one library in the Newark Region and in at least one library in the State Library region, preferably in the concentration of population around the Camden-Philadelphia metropolitan area. The online service should be evaluated in terms of:

a) Cost per search compared with manual cost per search;

b) Number of online searches requested during various time periods;

c) Subject of the online search;

d) Type of patron requesting the online search.

2) The funded libraries would be required to keep comprehensive records of the impact of such services in expanding reference requests and in broadening the base of patrons.

3) The funded libraries should require each patron of the online search service to complete a questionnaire asking about satisfaction with the search, willingness to pay for such service, amount patron would be willing to pay, etc.

4) The State Library Development Bureau would actively promote, through sharing of the online access, cooperation with special libraries, school libraries, and college libraries in the region.

Several studies have been reported in the literature by information brokers (SDC, Lockheed, etc.) which would provide background information, research models, and comparative data.

Recommendations #5 through #7 address the need for better management data in the area of periodical information:

5) The State Library should define "periodical" precisely for better comparative statistical reporting. (See p. 39)

6) The State Library should require continual, consistent statistical reporting of periodical article photocopying (borrowing) as an input to rational decisions for area and regional resource sharing and smooth network operation. (See p. 38)

7) The State Library should require libraries to report the number of titles on microform or in microfiche, disregarding the number of actual reels of film or cards of fiche.

8) The State Library should focus on lateral borrowing, cooperation and resource sharing arrangements (especially in the State Library region) within areas and between areas to facilitate access to periodical information. (See Table 11, p. 26)

9) The State Library should require the reporting of more complete and accurate data about periodical information requested from and supplied to each area library. This data would be used for management decisions to provide better service as the area library periodical collections and the other periodical collections in the New Jersey library network back up, in hard copy, the citations obtained from the online services. More complete and accurate data is needed about current informal, non-recorded requests for periodical articles and information within each or a library. Such data might be recorded on forms designed as a checksheet (to minimize time spent in data gathering).

IV. FINDINGS FROM THE INTERVIEW DATA

A. Summary of the Findings

The interview data provided the following information:

1. Area library periodical collections are general collections with some libraries developing strengths in social science subjects or in the arts (p. 12).

2. Back issues are stored in hard bound copy for as long as possible (p. 13).

   Microfilm is used to solve storage problems and to extend the back runs of many periodicals (p. 12).

   Libraries use few objective measures to determine how long to store back issues or to decide which titles to retain (p. 13).

3. Little attention has been devoted to conscious examination and development of lateral borrowing either within one area or between neighboring area libraries (p. 12).

Each of these findings will be addressed in more detail as follows:

Section B: Area Library Collections Are General Collections

Section C: Back-Issue Periodical Storage

Section D: Lateral Borrowing within and between Area Libraries.

B. Area Library Periodical Collections

The expected broad range of popular periodicals characterized most of the collections in the area libraries. Where particular areas of subject emphasis occur, these areas are generally business, education, art, and local history. Two area libraries reflect their unusual demographic and geographic characteristics by having especially strong collections of 1) periodicals published for the Black community and 2) marine biology.

The State Library sets the minimum number of periodicals for an area library at 350 titles. Two libraries have collections of over 1000 titles and three other libraries have collections which approach this number. One library collection falls below the minimum number. Hence, a significant number of area libraries have periodical collections far exceeding the minimum state standards. In addition, most area libraries are depositories for government documents, some of which are periodicals. Practice differs in counting the number of periodical titles depending on whether or not the government document titles are included, on whether newspapers, gift subscriptions, and abstracting and indexing services are included, and on whether serial services such as Moody's are included. State statistics would benefit from a more precise definition of the word "periodical".

Table 1 shows the subject strengths of the area library periodical collections.

Table 1

Subject Strengths of NJ Area Library Periodical Collections as Perceived by the Area Librarians

Subject Strengths	Region	
	Newark	State Library
Balanced, No Particular Subject Emphasis	4	6
Business	5	1
Education	3	3
Arts	3	2
History	1	1
Other	1 each Black journals Sci-Tech. Library Science Children's Journals	1 each Marine Biology Current Affairs

C. Back-Issue Periodical Storage

Tables 2 and 3 show the range of titles in area library periodical collections. Table 2 includes those titles currently purchased and the number of archival titles in microform.

Table 2

Number of Periodical Titles in NJ Area Library Collections - 1977

Number (#) of Titles	Region	
	Newark	State Library
Inkprint		
Lowest # Titles	400	185
Highest # Titles	1106	1286
Median # Titles	697	500
Microform		
Lowest # Titles	0	10
Highest # Titles	319	402
Median # Titles	48	92

Table 3

NJ Area Library Archival Policies for Inkprint Holdings

# Years Inkprint Journals Stored	Region	
	Newark	State Library
Policy varies by J Title	6	5
3-5 years	-	4
5-10 years	3	-
10 years or more	3	2

Holdings policies for back issues vary widely from library to library and, in general, reflect a lack of any objective criteria for decisions about what to hold and for how long. Storage space and "usage" (a subjective determination in all but two libraries) are the two basic criteria for holding decisions. A third criterion in many libraries is access to the periodical articles through available indexes. Only two libraries keep any records of usage for back titles. The study found an enthusiastic acceptance of microform as a solution to problems of storage space and missing issues and articles.

Area libraries usually have some of the periodical collections in microform, and one area library has over 400 titles in microform. Another library expects to triple its holdings from 80 titles to 240 titles this year. The enthusiastic acceptance of this medium can be most easily explained in terms of cost savings derived from the microform most generally purchased--microfilm which will print a positive image. The cost/benefits of microfilm are, first, savings in storage costs. Microfilm takes less shelving space. Second, binding costs can be invested in microfilm. Third, microfilm is rarely stolen, seldom mutilated. The low level of

microfilm theft may change as microfiche, used with portable readers, replaces the large microfilm reader-printers and the reels of film. The low level of microfilm theft and mutilation pleases librarians because user access to periodical holdings is not frustrated by missing issues and articles, an all too frequent occurrence in both bound and unbound hard copy. Fourth, ease of operating a reader-printer simplifies and expedites the photoduplication process. A heavy bound volume does not have to be carried to a copier, nor does a single issue (extracted from a tall pile or tight hanging envelope) have to be taken to the copier. Narrow margins in bound volumes and oversize pages in single issues do not result in either blurring of one edge or missing a part of the publication.

Despite a similar number of hardcopy titles acquired in the Newark and State Library Regions, the State Library Region acquires almost double the median number of Newark Region titles in microform. This is an important finding. Several explanations can be offered for this discrepancy:

1) The libraries in the State Library Region have problems of storage space mandating microforms instead of hardcopy for archival materials. The archival policy figures in Table 3 may relate to this.

2) The libraries in the State Library Region are overcoming problems of the more rural and lesser developed region and are purchasing titles in microform to "catch up". Figures from the annual reports New Jersey Public Libraries - Statistics, 1968 to 1977, tend to bear this out.

3) The libraries in the State Library Region are more attuned to the "new technology" than the Newark Region libraries. No evidence found bears out this hypothesis.

D. Lateral Borrowing Within and Between Area Libraries

The study sought to find ways of determining evidence of lateral (horizontal) borrowing and resource sharing versus vertical borrowing and resource sharing. The interviewer asked about inclusion of various types of libraries in the area's union list of periodicals. Informal cooperation was examined between types of libraries in the area. Other formal sources of information about library collections within each area were investigated, especially directory information. Tables 4, 5, and 6 summarize the data obtained from the structured section of each interview. This data was amplified and explained in the unstructured part of the interview. In general, the library personnel interviewed had not conceptualized access to information in terms of lateral and vertical resource sharing. No records document lateral borrowing, primarily because this is regarded as informal cooperation between professionals who are personally compatible.

Table 4

Types of Libraries Included in NJ Area Library Union Lists

Type of Library	No. of Libraries in Region	
	Newark	State Library
Public	11 (100%)	11 (100%)
Special	5 (45%)	9 (82%)
College	4* (36%)	9** (82%)
School	4 (36%)	9 (82%)

* - no colleges (community, state or private) in 1 area.
** - no colleges (community, state or private) in 2 areas.

Table 5

Type of Library with Which Area Libraries Cooperate Closely or Informally Within the Area

Type of Library	No. of Libraries	
	Region	
	Newark	State Library
Public	5	5
Special	5	7
College	9*	9**
School	4	4

* - no colleges (community, state or private in 1 area.
** - no colleges (community, state or private in 2 areas.

Table 6

Formal Sources of Information About Libraries Within Area

Formal Information Source	No. of Libraries	
	Region	
	Newark	State Library*
Directory	4	1
Listing of Subject Strengths	2	1

* In addition, for South Jersey, the Philadelphia Chapter of SLA, "Directory of Libraries and Information Sources in the Philadelphia Area, 4th ed. 1977" is useful, includes South Jersey libraries, and is found in most libraries in this sub-region.

The most common tool for area periodical resource sharing is the union list of periodicals which is a mandated responsibility of the area library. However, only 42% of the libraries studied include holdings of all area, special, college, and school libraries in their union lists. The type of library most often excluded from the union list was the school library. The relationship needs to be explored between

exclusion of periodical holdings of this type of library (especially in the school's professional collections) and the strong educational subject emphasis in periodical collections claimed by six of the libraries (see Table 1 - p.12). Three of these six libraries included school library holdings in their lists, two excluded school library holdings, and one library could not provide this data. Access to available periodicals in a geographic area could be increased by including holdings of all types of libraries. The State Library Region libraries include twice the number of special, college and school library holdings in their area union lists as the libraries in the Newark Region. This may reflect the attempt to overcome problems of greater distances in the "vast" State Library Region and a need to share information resources because of rapid development in recent years.

In addition to the union list, a second common tool for resource sharing is a directory of libraries. These directories list personnel, hours, collection size and contents, special collections, borrowing privileges, etc.

In the northern half of the state, no comprehensive directory exists to facilitate resource sharing by listing library subject strengths, either in book or periodical collections. However, many librarians know of the subject strengths of nearby libraries from experience, visits and personal friendships. Southern New Jersey benefits from the comprehensive Directory of Libraries and Information Sources in the Philadelphia Area compiled by the Philadelphia Chapter of Special Libraries Association. This directory, now in its 14th edition, includes public, college and special libraries in Philadelphia, Eastern Pennsylvania, Delaware, and Southern Jersey. The directory could be used as a model for a similar directory for the New Jersey network.

To help a patron with an urgent information need, librarians will send persons, if they are willing, directly to a nearby library having the periodical. This enables the person to get needed information quickly and avoids the time-consuming network referral system. Sending a person to a nearby library for a periodical is a universal practice--and always an unrecorded service.

Another similar practice is telephoning a professional colleague in a nearby library (often a special library not accessible to the general public) for a rush photocopy of the needed article. Procedures vary. A formal photoduplication request may be sent to record the transaction after it takes place. The patron may pick up the article at the institution having the library or it may be mailed or personally delivered to the area library. Usually this act of service is also unrecorded. These informal, personal practices and procedures are, in many cases, a highly effective and efficient local network for fast access to periodical information.

The interview questions about practices and procedures were open ended to elicit as much information as possible. Every staff member interviewed stated in one way or another that informal practices helped to expedite service to the patron and that the formal procedures were far too time consuming for the urgency with which periodical information is needed.

One reason for the proliferation of informal practices to speed information service is the bottleneck in the network at the State Library. One problem with which the State Library must cope is the geographically far-flung group of libraries it serves, especially in comparison to the more compact geographic area served by Newark. A second problem, as perceived by the area reference librarians, is the limitations of the State Library periodical collection and the constraints on this collec-

tion because of the multipurpose mission (including legislative service) of the library. A third problem perceived by area reference librarians is the slow speed of document delivery which the librarians feel is unacceptable to most patrons. Area libraries served by the State Library generally rely on the U.S. mails to send periodical article photocopy requests to Trenton and to receive the photocopied articles in return. Mails are slow in and out of the state government bureaucracy in Trenton. Additional time is required for document delivery when the State Library must refer the request to another specialized service or research level library. Total elapsed turnaround time for periodical article photocopy requests seems considerably higher for area libraries dependent on mail service than for area libraries which can pick up documents on a regular basis from a specialized service level library. However, this study did not investigate the number of requests filled and the time elapsed in filling requests. A continual study of speed of service and of numbers of requests filled should be made available to area library directors for management purposes.

The need for clinical medical information in periodicals is a need which must be satisfied especially quickly for the non-health professional. To provide acceptable levels of service in this subject area, libraries all over New Jersey have developed close working relationships with local hospital libraries. The bibliometric data shows that this relationship is a reciprocal one involving real resource sharing. The documented quantity of clinical medical periodical information requested is a major finding of this study. The documented findings may be multiplied many times over by undocumented informal procedures to secure articles in medical periodicals and journals.

Close informal relationships exist between community college libraries and the area libraries. The relationship between special libraries and the area libraries is more reciprocal than generally perceived.

All area libraries feel a need for more lateral borrowing to speed service, especially in the area of providing information from periodicals. The Bergen-Passaic Library Association is an attempt to implement this idea. South Jersey libraries have acknowledged the informal cooperation of Stockton College in helping to overcome the lack of a major, in-depth periodical collection in this part of the state.

The most perceptive comment about the effectiveness of the informal practices and procedures for supplying urgently needed periodical information came from the librarian who noted that, no matter what kind of arrangements were set up, the relationships between people were what caused any informal arrangement to fail or to succeed.

V. FINDINGS FROM THE BIBLIOMETRIC PHOTODUPLICATION DATA

A. Summary of the Findings

The bibliometric photoduplication data produced the following information:

1. Manual subject analysis of the periodical titles requested showed a strong interest in medical and health titles, in science and technology titles, in business and education (p. 22).

2. Patrons generally request recent titles. Sixty-eight percent (68%) of the requests were in periodicals published from 1971 to 1977. Eight-five percent (85%) of the requests were in periodicals published from 1951 to 1977 (p. 25).

3. At the Area Library level, the New Jersey library network is essentially a public library network, drawing little from other types of libraries and contributing little to them (p. 26).

4. The distribution of titles requested is so widely scattered that photocopying to fill patron requests does not violate the copyright law (p. 27).

5. Searching of six major online data bases would provide fast, feasible access to periodical information in area libraries (p. 30).

These findings will be expanded as follows:

Section B: Subject Analysis of Periodical Titles Requested

Section C: Recency of Periodical Titles Requested

Section D: Periodical Borrowing Patterns in the New Jersey Library Network from the Perspective of the Area Libraries

Section E: The Network and the Copyright Law

Section F: Online Data Base Access to Periodicals

B. Subject Analysis of Periodical Titles Requested

A preliminary manual analysis of the title data showed the expected spread of requests across all areas of knowledge. Titles were first classified using Ulrich's classification scheme (Table 8), then aggregated into more general categories (Table 7). The data confirm the interview findings of a major patron need for medical and health information. Table 7 presents this data.

Table 7

Area Libraries in New Jersey - 1977: General Subject Classification of Periodical Titles Requested

Arts & Humanities		Social Sciences		Science & Technology	
Humanities	64	Business	80	Medicine & Health	144
Arts	52	Education	69	Science	85*
		Misc. Social Sci.	48	Technology	84
		Librarianship	34	Trades	18
		Psychology	33	*Incl. 18 periodicals on Conservation and the Environment	
		Law	23		
		Community Affairs	21		
		Women's Interests	4		
Total	116	Total	312	Total	331

Miscellaneous Categories

Unclassifiable	69
Bibliographic Forms	33
General Interest	25
Total	127

The surprisingly low number of requests for titles in the arts and humanities may reflect this traditional emphasis in many libraries, and indicate that demands in this area are better satisfied by existing periodical and book collections. A similar rationale, that the library collections contain much how-to-do-it material, may also explain the low number of requests in the area of the trades. However, before any firm conclusions could be drawn from this data, library holdings in these areas would have to be compared with these requests.

The large number of unclassifiable periodicals in the miscellaneous category leads one to wonder if some periodical titles were inaccurately verified. The use of Ulrich's classification scheme and title listings could also be responsible. Ulrich's is comprehensive, but not complete. For instance, Ulrich's does not include proceedings, annuals, newsletters,

local publications, and bibliographies. The problems of new titles, cessations, and title changes also cause difficulty.

The following ranking of specific classification categories from Ulrich's lists those categories having more than 10 titles.

Table 8

Subject Rankings of Periodicals: NJ Area Library Requests

Subject	# of Titles
Medical Sciences	110
Education	67
Library & Information Sci.	34
Psychology	34
General Interest	25
Biology	24
Law	23
Art	15
Business & Industry	14
Sciences: Comprehensive Work	14
Music	13
Environmental Studies	12
Newspapers	12
Management	12
Sociology	12
Marketing	11

Medical titles rank first, followed by titles in education. Not surprisingly, librarians seem to be their own best customers in the ILL photoduplication request network.

The manual subject classification was preliminary to computer analysis. A tolerable 4% error occurred in titles recorded (926 computer, 886 manual).

Additional computer analysis of the subject spread of the titles, especially in relation to time and costs of online searching, should be included in Phase III of this study (see Recommendations).

Computer data analysis showed that 325 titles represented 2458 photoduplication request records available for the year 1977 in area libraries. Table 9 shows the distribution of the 2458 records between the Newark and the State Library region. The table also shows the distribution of other characteristics between regions. Further computer analysis of the data could show title distribution and subject distribution of periodicals requested between regions.

Table 9

Characteristics of the New Jersey Library Regions

Characteristics	Newark		State Library Region	
	#	%	#	%
Periodical Photocopy Records	1,191	48	1,267	52
Libraries w/ Records	10	50	10	50
Population (persons)	3,823,360	59	2,620,736	41
Area (Sq. miles)	1,214	19	5,205	81

6. Recency of Periodical Titles Requested

Table 10 shows that patrons are requesting recent articles. A back file of 25 years would answer over 90% of all requests. A back file of 15 years would answer 85% of all requests. A backfile of only 7 years answers 68% of all requests. This information documents the decisions of many area libraries to keep their older backfiles on microform to save storage space for seldom requested material.

Additional computer analysis to see which titles and subjects are most often requested in various time periods would provide more objective data for decisions about storing back titles. This collection management data should be collected and analyzed in each area library on a continuing basis.

Table 10

Publication Dates of Periodical Articles Requested on ILL in New Jersey Area Libraries - 1977

Decade	# Articles	% Articles	Cum.% Articles
1971-1977	1686	67.5	67.5
1961-1970	441	17.7	85.2
1951-1960	160	6.4	91.6
1941-1950	71	2.8	94.4
1931-1940	36	1.4	95.8
1921-1930	25	1.0	96.8
1911-1920	15	0.6	97.4
1901-1910	9	0.4	97.8
1900 & Earlier	55	2.2	100.0
Total	2498	100.0	100.0

D. Periodical Borrowing Patterns in the New Jersey Library Network from the Perspective of the Area Libraries

From the perspective of the area libraries, in which data for this study was gathered, periodical borrowing patterns show that the New Jersey library network is essentially a network of public libraries. This finding was produced by both the interview data and the photoduplication record data. The interviews showed this to be true in compilation of union lists (Table 4). Informal, within-area cooperation is less public library oriented; however, the amount of such cooperation and borrowing could not be documented.

The photoduplication record data shows that formal borrowing is limited to borrowing among public libraries in approximately 85% of the records analyzed (85% is the average of the number of originating and satisfying requests analyzed). Table 11 shows this data. College and university libraries, and special libraries, each contribute about 6% to the system.

School libraries contribute about 2% to the system, leaving 1% of requests missing documentation of point of origin or satisfaction of a request.

Table 11

Periodical Borrowing Patterns in the New Jersey Library Network: An Analysis of 1977 Photoduplication Requests

Type of Library	Originating Requests				Satisfying Requests			
	#	%	#	%	#	%	#	%
Public			2063	82.6			2210	88.5
Area Library	966	38.7			946	37.9		
Other PL in Area	1048	42.0			110	4.4		
Other Area in Region	35	1.4			32	1.3		
Other Area Outside Region	5	0.2			60	2.4		
Newark Public Library	4	0.2			402	16.1		
State Library	-	-			660	26.4		
Atlantic City & County PL	5	0.2			-	-		
College & University			121	4.8			170	6.8
Community (2 yr)	102	4.1			24	1.0		
State (4 yr)	12	0.5			34	1.4		
Rutgers	-	-			73	2.9		
Private (4 yr)	7	0.3			20	0.8		
Princeton	-	-			19	0.8		
Elementary & Secondary School			81	3.3			6	0.2
Special Library			230	9.2			67	2.7
Hospital	124	5.0			46	1.8		
Research Facilities	97	3.8			18	0.7		
Commercial Operations	9	0.4			-	-		
Private Collection	-	-			3	0.1		
Data Missing			3	0.1			45	1.8
Total			2498	100.0			2498	100.0

The public libraries look to the college and university libraries to satisfy their requests more than to school or special libraries. However, the special libraries actually request more articles from the public libraries than any other type of library. Combining this information with the interview findings of patron requests for science and technology articles and for medical and health articles, more areas of cooperation should be explored between special libraries and public libraries. Outside of the public libraries, Rutgers plays a larger role than any of the other colleges and universities in satisfying requests. The community college libraries draw heavily on the network for needed periodical articles. Ways of encouraging more formal cooperation and resource sharing in this area might also be explored.

E. The Network and the Copyright Law

The data show that periodical article photocopying in libraries in no way violates the copyright law. The scatter of records and of titles in 1977, a year when librarians were not fully cognizant of the new 1978 copyright law, is so broad that any curtailment of this service could be construed as a limitation of freedom of access to information.

Data analysis shows that the most frequently requested periodical, The New York Times, was requested only 36 times, 1.4% of the total 2498 records. The documentation of scatter continues and is well illustrated in Table 12. Only 42 journal titles, 5% of the total titles in the data base, were requested 10 or more times. These titles represented a total of 672 articles, still only 27% of the total records in the data base. The articles requested, although concentrated over the past decade, span the past century.

Table 12

Ranking of Most Frequently Requested Periodical Titles
in New Jersey Area Libraries - 1977

Rank #	Titles	# Requests	Abs. % of Total	Cum% Data Base	Rank #	Titles	# Requests	Abs. % of Total	Cum% Data Base
1	NEW YORK TIMES	36	1.4	1.4	22	NEW YORKER	13	0.5	18.1
2	NEWSWEEK	32	1.3	2.7	23	PERSONNEL JOURNAL	13	0.5	19.1
3	JOURNAL OF READING	31	1.2	3.9	24	READERS DIGEST	13	0.5	19.1
4	SCIENTIFIC AMERICAN	28	1.1	5.0	25	SATURDAY REVIEW	13	0.5	19.6
5	TIME	25	1.0	6.0	26	AMERICAN HOME	12	0.5	20.1
6	N ENGL J MEDICINE	24	1.0	7.0	27	CHEMISTRY	12	0.5	20.6
7	READING TEACHER	24	1.0	8.0	28	MOTOR TREND MAGAZINE	12	0.5	21.1
8	AM JOURNAL OF NURSING	22	0.9	8.9	29	AMERICA	11	0.4	21.5
9	SCIENCE	22	0.9	9.8	30	COLLEGE & RESEARCH LIBS.	11	0.4	21.9
10	MC CALLS	21	0.8	10.6	31	JOURNAL AMA	11	0.4	22.3
11	RESEARCH QUARTERLY	20	0.8	11.4	32	LIFE THREATENING BEHAVIOR	11	0.4	22.7
12	LIBRARY JOURNAL	17	0.7	12.1	33	SUNSET	11	0.4	23.1
13	MECHANICS ILLUSTRATED	17	0.7	12.8	34	FEDERAL REGISTER	10	0.4	23.5
14	POPULAR MECHANICS	17	0.7	13.5	35	J CONSUMER AFFAIRS	10	0.4	23.9
15	SATURDAY EVENING POST	17	0.7	14.2	36	LIFE	10	0.4	24.3
16	HARVARD BUSINESS REVIEW	16	0.6	14.8	37	NATION	10	0.4	24.7
17	CLEARING HOUSE	15	0.6	15.4	38	NATIONAL GEOGRAPHIC	10	0.4	25.1
18	GOOD HOUSEKEEPING	15	0.6	16.0	39	ORGANIC GARDEN. & FARM.	10	0.4	25.5
19	NEW YORK TIMES MAGAZINE	14	0.6	16.6	40	POPULAR ELECTRONICS	10	0.4	26.9
20	ADMINISTRATIVE MGMT	13	0.5	17.1	41	SCIENCE DIGEST	10	0.4	26.3
21	LADIES HOME JOURNAL	13	0.5	17.6	42	SEVENTEEN	10	0.4	26.7

F. Online Data Base Access to Periodicals

Searching one single data base would not retrieve the wide range of periodicals requested by New Jersey area library patrons. However, searching approximately six or seven major data bases would retrieve the majority of periodical titles requested. Tables 13 and 14 show the number of titles in the study covered by six major online data base search services.

Table 13

Online Data Base Coverage of Periodical Articles Requested in New Jersey Area Libraries - 1977.

Data Base	# Articles Covered	
	Ab. Frequency	Rel. Frequency (%)
ISI Indexes (Science Citation Index® & Social Science Citation Index®)	990	39.6
Magazine Index (MI)	963	38.6
ERIC	530	21.2
MEDLINE	422	16.9
N. Y. Times Information Bank (IB)	321	12.9
Library & Info. Sci. Abt (LISA)	94	3.8

Table 14

Online Data Base Coverage of Periodical Articles Requested in NJ Area Libraries in 1977 (Recency of Titles Requested)

ARTICLES/ YR	DATA BASE																	
	ISI			MI			ERIC			MEDLINE			IB			LISA		
	#	%	Cum. %	#	%	Cum. %	#	%	Cum. %	#	%	Cum. %	#	%	Cum. %	#	%	Cum. %
1977	80	8.1	8.1	121	12.6	12.6	40	7.5	7.5	26	6.2	6.2	31	9.7	9.7	1	1.1	1.1
1976	163	16.5	24.6	162	16.8	29.4	93	17.5	25.0	66	15.6	21.8	51	15.9	25.6	13	13.8	14.9
1975	111	11.2	35.0	143	14.8	44.2	82	15.5	40.5	46	10.9	32.7	36	11.2	36.8	7	7.4	22.3
1974	117	11.8	47.6	75	7.8	52.0	78	14.7	52.2	28	6.6	39.3	18	5.6	42.4	7	7.4	29.7
1973	56	5.7	53.3	52	5.4	57.4	30	5.7	60.9	24	5.7	45.0	14	4.4	46.8	6	6.4	36.1
1972	55	5.6	58.9	45	4.7	62.1	23	4.3	65.2	21	5.0	50.0	16	5.0	51.8	7	7.4	43.5
1971	36	3.6	62.5	34	3.5	65.6	27	5.1	70.3	23	5.5	55.5	11	3.4	55.2	4	4.3	47.8
1970 & earlier	372	37.5	100.	331	34.4	100.	157	29.7	100.	188	44.5	100.	144	44.8	100.	49	52.2	100.
	990	100.		963	100.		530	100.		422	100.		321	100.		94	100.	

Most online data bases have about 10 years of files accessible by interactive searching, with older files available for computer searching in a batch process, offline. From the data in Table 14, most requests could be answered through interactive online searching of the files.

The primary objective of this section of the study was to examine the feasibility of online data base search service in the area libraries. The recency of articles requested and the broad coverage of the online data bases would make online searching feasible indeed. Feasibility is defined as access to information in terms of locating articles on specific topics and as verification of citation accuracy. Feasibility does not include acquisition of the actual document requested. The implementation of a comprehensive union list of periodicals available in the New Jersey network would greatly enhance feasibility of online access and add to the informational services available in the area libraries.

VI. DOCUMENT DELIVERY OF PERIODICAL ARTICLES REQUESTED IN THE NJ LIBRARY NETWORK

The New Jersey Library Network is divided into major geographic regions equal in population but disproportionate in area--one area being five times as large as the other. The larger area of the state stretches from the northernmost point in New Jersey to the southernmost point. This large area is served by the State Library. The northeastern corner of the State, an area less than one-fifth (1/5) the size of that served by the State Library, is served by the Newark Public Library. In terms of ease and speed of document delivery, the present regional service boundary presents major problems for the larger region comprising more than four-fifths (4/5) of the state. These problems may increase as recent census figures show northern New Jersey losing population and southern New Jersey gaining population. For instance, the 1977 census showed Ocean County with a population increase of 109,500--a growth of 50% from 1970 to 1977.

The obvious problem is distance. Periodical information is frequently needed "yesterday". As the system presently operates, the patron must be willing to wait several weeks for a needed photocopy, with no assurance even then, that the needed periodical information request will be satisfied. Several reasons make the long wait the rule rather than the exception. While the objectives of the system are to serve the patron, the system procedures make the objectives impossible to attain.

When the request for periodical information originates in one of the 11 area libraries in the State Library Region (the Trenton Public Library was not included), the request must be forwarded by mail to the State Library. Upon receipt of the request, the State Library checks its serial holdings for availability of the periodical. The article, when

available, is photocopied and returned to the area library or directly to the originating local library, not directly to the patron. When the article is unavailable, the request is forwarded by the State Library to Rutgers or Princeton. Although each level of the hierarchy forwards the periodical article, when found, directly to the originating library, the only way a request can be expedited in the upward steps is for the librarian to be aware of the holdings in the State Library and each of the two university libraries and for a willing patron to be able to drive to these libraries to photocopy the needed article. In the State Library region, a trip to Trenton, Rutgers or Princeton requires at least a 90 minute drive for the patron living in Sussex County and Cumberland County, and requires even more time for the patron from Cape May County.

Time, distance, and systems procedures are three limitations to prompt service by the State Library to its farflung region. In terms of improving service in the future, time and distance problems can be overcome using modern technological innovations (such as implementing computerized online data base search service and requesting copies of the article directly from the data base). Systems procedures can be changed and streamlined.

The complaints and frustrations about the State Library service to the area libraries were in marked contrast to the comments about the Newark Public Library and its service to the Northeastern Region. The Newark Library has a long and distinguished history as a strong public library, while the State Library serves the state as a multi-purpose library. Second, the Newark Library is geographically close to all the area libraries it serves. A drive to the Newark Library takes little time and several area libraries schedule personnel to pickup materials

from Newark daily. College and research libraries abound in the Northeastern Region. The Rutgers University libraries are also nearby and accessible, just over the regional boundary. Also nearby and accessible to many patrons in the Northeast region are the many libraries in New York City.

Keeping track of the satisfaction of patrons' photocopy requests for periodical information is not easy because the system provides little feedback to the originating library. When the periodical cannot be located, the originating library frequently is not notified and the item remains in "limbo". Bloomfield Area Library, a ten-minute drive from the Newark Public Library, characterizes the optimum example of periodical information service in prompt response to a patron's request. A corp of volunteers to assist in record-keeping assures that the patron can learn the status of his request at any time. The State Library could use this Area Library as a model of service.

VII. METHODOLOGY

A. Universe Studied

The study focused on New Jersey area libraries. Area libraries were chosen for the study because they represented a manageable universe which is characteristic of every part of the State of New Jersey. As the first level of referral within the New Jersey library network, these libraries each have a periodical collection mandated to be at least 350 titles, with back files for 10 years of the titles with continuing reference value. In terms of implementing an online data base search service, the area libraries would be the logical level at which to implement online service to serve the patrons of New Jersey public libraries.

B. Sources of Data

The information for this study was gathered in two parts. First, area library staff members involved in supplying periodical information to patrons were interviewed. These staff members were usually the reference librarian and/or the ILL librarian. Frequently, as their schedules permitted, the area library directors also participated in the interview. Second, the photoduplication request forms for 1977 available in each area library were coded and analyzed as a validation of the more subjective data gathered in the interviews.

1) The Interview Data -- The interviews with area library staff members involved in supplying periodical information to patrons were structured to provide three pieces of information:

A description of the periodical collection;

Available tools for periodical resource sharing;

Informal practices and procedures for supplying urgently needed periodical information.

All area libraries were contacted within three weeks at the end of March and the beginning of April, 1978. Both branches of the Monmouth area library were visited as the headquarters library functions more as a branch than as the main library. Otherwise, branches of area libraries were excluded from the study. The Trenton area library was excluded from the study because of its close proximity to and special relationship with the State Library. Also, the Trenton area library was in the midst of a move to a larger facility, and its records and its staff were both unavailable. The Newark area library was excluded from the study because of its dual role as one of the "specialized service level" (regional) libraries in the state.

2) The Bibliometric Photoduplication Record Data -- The bibliometric photoduplication data provide concrete evidence of those periodicals requested in the New Jersey library network as recorded in the area libraries. For the most part, the interviews provided perceptions and opinions of the interviewees. These perceptions were reinforced by the concrete supporting evidence in the bibliometric data. The amalgamation of evidence from the interivews and from the bibliometric data provides an accurate picture of periodical request activity in 1977. This picture has value in the description of current practice and in the provision of a frame of reference for the experiment recommended for Phase III.

Bibliometric data is data obtained from analysis of various facets of written communication, i.e., in this study, from photoduplication requests referred to and initiated in the New Jersey area libraries. These requests include the formal requests for document delivery of periodical articles in the New Jersey network. Although most academic and public libraries in the network think of document delivery as acquisition of books, the special librarians think of document delivery as acquisition of periodical articles. For these librarians, ILL means periodical articles, not books. For them, periodicals are their primary source of information. Because of publication time lags, periodical information is often more up-to-date than book information and, hence, an important information source for all types of libraries in the New Jersey network. Network researchers should focus equally on books and periodicals when investigating ILL.

The photoduplication request records also include records of other requests in addition to periodical articles. The portion of other requests is small, only 15% of the total records examined. Because the

study examined the 1977 records as available, comparisons of one area library with another have no meaning. Aggregation of data into the two state regions, however, was enlightening. We did find that libraries request similar types of materials to be photocopied. These materials include copies of missing pages from encyclopedias and books, poems, genealogical information, patents, and items from Sam's Photofax (one of the most frequent requests). For this study, the photoduplication request records for periodical articles were the only ones tabulated.

C. Preparation of the Bibliometric Data for Analysis

Bibliometric data requires classification and coding for computer analysis. An excellent handbook (Nicholas & Ritchie) explaining the steps in bibliometric research has recently been written in Great Britain where bibliometric research is more widely applied than in the United States.

A listing of the steps in bibliometric data preparation for this study is as follows:

1) Coding of 1977 photoduplication requests for periodical articles:
    a) Library identification number
    b) Record sequence number
    c) Periodical name
    d) Year of publication for article requested
    e) Decade of publication for article requested
    f) Year of publication within 1970's decade, as applicable
    g) Type of library originating request
    h) Type of library to which request was finally referred
    i) Indicator of further referral from area library
    j) Periodical subject classification code (from Ulrich's)

4) Online data bases indexing periodical requested for publication. (The study collected 2498 records of 1977 photoduplication requests with the above information, where available for each record).

2) Organization of a data base of periodicals requested in New Jersey area libraries in 1977:

This list was organized and alphabetized from the approximately 2500 records gathered in the area libraries.

3) Assignment of a sequential numeric code to each unique title in the New Jersey periodical data base.

4) Classification of each unique periodical title using Ulrich's classification scheme.

5) Identification of periodical titles in the New Jersey data base indexed by each of the following online services:

a) Magazine Index (Popular Periodicals)

b) LISA (Library and Information Science Abstracts)

c) ERIC (Educational Periodicals)

d) MEDLINE (Index Medicus Online)

e) ISI Indexes (Science Citation Index & Social Science Citation Index)

f) N.Y. Times Information Bank

Time constraints prevented identification of the business periodicals covered by an appropriate online data base. However, the periodical coverage of the other services indicates a strong probability that business periodicals in the New Jersey data base would be well represented in an online data base.

After the data has been coded as outlined above for each record, the final data preparation includes keypunching each record and verifying the resulting punched card for accuracy. The data is then ready for computer analysis.

9. Constraints of the Data

A serious constraint to analyzing the feasibility of implementing an online data base search service in the New Jersey library network is the lack of comparative cost data. This data is lacking in the area libraries and would include:

1. Costs of filling out a request form;
2. Costs of verification of accuracy of citation for material requested;
3. Costs of subscription to hard copy (ink print) versions of abstracting and indexing services versus costs of online searching of the computerized data base.

A second constraint to the available data is its lack of consistency. The data is not mandated by the State Library in any area library reports, hence there are as many procedures for handling photoduplication requests as there are area libraries in the state. The data available depends on the procedures. In two libraries data was not available because the records had been discarded.

No librarian could estimate the unrecorded requests, satisfied informally, which negate the need for formal requests through the ILL photocopy system. Informal procedures include sending the willing patron to a nearby library holding the needed document, making the request by phone to speed the transaction, and calling a personal friend or a nearby special library for the needed article. Interviews elicited the information that many requests from special libraries and business firms go unrecorded or are masked by having a patron request the information as a private rather than a corporate or institutional need. No data was available in the N.J. network from which the proportion of lateral borrowing to vertical borrowing could be measured.

A constraint on the interview data was the lack of a consistent definition of the term "periodical". Libraries may vary in their definition by including or excluding abstracting and indexing services, gift subscriptions, free-for-the-asking subscriptions, and serial services such as Moody's etc. This study adopted the scope of the term used in each area library.

E. Definitions

Working definitions were adopted for the following terms:

1. Access is 1) a method or device whereby a document may be found; 2) permission and opportunity to use a document. Access to (knowing about) a document is distinguished from acquisition of (obtaining) a document. (See document delivery)

2. Bibliometric data bases are those compilations of information about books, periodicals and other traditional library materials.

3. Bibliometric data are figures tabulated from the analysis of bibliographic records, such as the photoduplication records in this study.

4. Document delivery is the act of sending the photocopy of a periodical article from one library to another i.e., the acquisition of the periodical article.

5. Interlibrary loan is the borrowing of the copy of a periodical from one library by another for use by patron.

6. Feasibility is the capability of being done or accomplished and of being suitable for accomplishment.

7. Lateral (horizontal) borrowing is the loan materials between libraries at the same hierarchical level in the New Jersey network.

8. A network is an interconnected group of libraries or data bases governed by a set of rules for access and procedural administration.

9. Online is the state of active immediate connection to another library or data base in a computerized network.

10. A periodical for this study, has as its scope the definition of the term given by each area library.

11. Vertical borrowing is the loan of materials between libraries at different hierarchical levels in the New Jersey network.

F. Variables Examined

The following variables were examined as part of the study:

1. Interview Data

a) Subject characteristics of area library periodical collections

b) Available tools to locate additional periodical resources in other area libraries

c) Informal cooperative efforts within areas

d) Photoduplication requests filled by lateral borrowing

e) Photoduplication requests filled by vertical borrowing.

2. Bibliometric Data

a) Titles of periodicals requested on photoduplication forms

b) Year of periodical requested

c) Subject classification of periodical requested

d) Type of library in which request originated

e) Type of library satisfying request

f) Online data bases covering periodical requested.

G. Aggregation of Data by Region

The aggregation of data into two regional categories contributed to conclusions about the feasibility of access to online data bases by defining the patterns of access to information when major constraints of time and distance were involved. The regions, the State Library Region and the Newark Library Region, represent the first line of vertical referral for the area libraries and the second hierarchical level for the local

public library. The regional aggretation also illustrated effects of time and distance on library referral services.

The State Library Region is composed of eleven area libraries, each of which refers requests unable to be filled locally to the State Library. The Trenton Public Library is excluded from this list and was excluded from the study.

In the Newark Library Region, the Newark Library itself was excluded from the study for reasons given before. The twelve area libraries in the Newark Library Region include:

Bloomfield Public Library

East Orange Free Public Library

Elizabeth Free Public Library

Jersey City Free Public Library

Johnson Free Public Library (Hackensack)

Linden Public Library

Morris County Free Library (Whippany)

Paterson Free Public Library

Plainfield Public Library

Ridgewood Public Library

Wayne Public Library

Woodbridge Township Free Public Library

The eleven area libraries in the State Library Region include:

Burlington County Free Library (Mount Holly)

Camden County Library (Voorhees)

Cape May County Library (Cape May Court House)

Cumberland County Library (Bridgeton)

East Brunswick Public Library

Hunterdon County Library (Raritan Township)

Monmouth County Library
Headquarters Library (Freehold) and
Eastern Branch Area Library (Shrewsbury)

Ocean County Public Library (Toms River)

Phillipsburgh Public Library

Somerset County Library (Somerville)

Sussex County Library (Frankford Township)

Although each region has essentially the same number of area libraries, the State Library Region covers over four-fifths (4/5) of the area of the state and the Newark Library Region covers one-fifth (1/5) of the area of the state in its northeastern corner.

VIII. BACKGROUND AND RELATED RESEARCH

This study of periodical interlibrary loan in New Jersey is the first attempt to study access to and sharing of periodical information in the network of New Jersey libraries. The study directly addresses Goal III of Networks for Knowledge (NFK) (Library Development Committee) "Ensure that all library resources at the local, intermediate and specialized levels within the State of New Jersey are integrated as part of a coordinated network and further that these state resources be compatible and efficiently connected to the broad resources of library networks nationwide in the interests of providing every citizen of New Jersey with access to library and information materials and services." Goal II of NFK seeks to "ensure that all citizens of New Jersey have legal access to library resources somewhere within their reach to provide additional and more specialized library materials and services they want." A major resource for these additional and more specialized library materials is the network of bibliographic data bases computerized and available online through the service of commercial jobbers, OCLC, and the National

Library of Medicine. The intermediate service level designated within 45 minutes travel time from the home of each New Jersey citizen is the area library. Therefore, the feasibility of online bibliographic access in New Jersey area libraries becomes the focus of this first study of patterns of service in periodical information requests.

With the growth and development of computer usage for bibliographic control, and the need for resource sharing to cope with budget limitations, networking has become a popular concept in the United States. The concept includes access to bibliographic information available through interactive, online computerized data bases. These data bases are familiar to many libraries in hard-copy form as The New York Times Index, Index Medicus, Current Index to Journals in Education, Library and Information Science Abstracts and so forth. In addition to being printed as books, the data bases have been transferred to magnetic tape for use on a computer. The information contained on the magnetic tapes can be manipulated in ways that the printed data base cannot. For instance, the subject document can be located using keywords in the title and abstract as a subject index. The document can also be located using a thesaurus of controlled subject indexing terms. The usual author index to the document is frequently expanded so second and third authors can be located easily. Boolean combinations of terms can focus the search to retrieve especially relevant documents with a saving of time and money.

Several corporations, including Systems Development Corporation (SDC) and Lockheed Missiles and Space Company, Inc. (Lockheed), act as jobbers in making many online data bases available to library/information center subscribers through national telecommunications networks. In a 1975

impact study of online users, SDC found that library/information center managers

> "most often noted a reduction in search time, the ability to serve more users, and access information previously not available. They also mentioned increased user satisfaction. One manager reported that his organization, which had previously provided only minimal literature searching services, was now doing 200 to 300 searches per month." (Wanger et al., p.15)

The SDC evaluation investigated complaints about online services and found that the biggest complaint was that the online system had been so popular that the same size staff could not satisfy the number of requests. In 1976, Lockheed reported on an experiment in California using the public library as a point of access for the general public to major computerized data bases. The project was evaluated by a non-affiliated behavioral research firm and reviewed by an Oversight Committee of experts in public libraries, marketing, and information science. Because of the relevance and the significance of this study, the general conclusions revealed by the evaluation data are herewith quoted in their entirety:

> One of the principal purposes of the evaluation conducted by Applied Communication Research, as stated in Section 1, was to provide public library administrators with data which would allow them to make decisions about the utility of providing an online search service through the public library and to determine what the cost of such a service would be. The data in Section 3 were thus presented with the objectives of providing administrators with the kind of information that would be useful in planning for an online service under two different funding situations. No attempt will be made to summarize such specific data on users, usage patterns, and search costs in this section.
>
> Instead, this section contains general conclusions suggested by the evaluation data and a number of pertinent observations derived from the entire Project DIALIB experience. It should be noted that most of the following points are subjective judgments based on a combination of observation, "hard" data, and extensive interviews with project participants. Apparent causal relationships cannot be verified using data obtained in a highly uncontrolled, case-study approach. Although most observations cannot be verified, they are still important both as indicators of factors which may affect the success or failure of an online search service offered within a public library context and as indicators for future research.

It also should be noted that the impact of online search on a public library familiar with the requirements of indepth reference search will be different than on a small public library having minimal reference capabilities. We have tried to make this distinction clear in these conclusions.

(1) The public library can be an effective channel through which to provide an online service. (Which is not to say that public libraries are the most effective channel – the data cannot support such speculation.) Project DIALIB libraries averaged 90 searches per month during the free period and 24 searches per month during the pay period. Also, about 70% of online service patrons during both periods felt that the results of their search were of much value.

(2) Public libaries are not all equally well suited to provide online search services. At this time, online services are useful mainly to patrons needing information indepth. The principal users are primarily educationally sophisticated professionals. Thus, areas with a high concentration of individuals falling into the principal user categories provide the best "markets" for online services. Public libraries serving such areas would certainly find more demand for an online service than would public libraries located in areas with a low percentage of "information literates." The most effective service (in terms of high volume and rapid turnover) seems to be provided through those main libraries that are easily accessible and that have a high potential for direct contact (either by phone or through "walk-in" trade) with patrons requesting online searches. In contrast, a library which is not easily accessible, which has little direct contact with patrons, and which would probably receive the majority of online search requests via branch libraries, would probably be less effective.

(3) A public library interested in operating an online service should be aware of existing services which may be available to the public. If adequate services already exist to supply the information needs of user groups, the public library may not wish to enter into "competition" with such services.

(4) If an online service is readily available at the public library, a market does exist for the service. The data indicate that online system patrons are not frequent users for the public library reference service. Instead, they are highly educated professionals and students from a number of varied disciplines who do not normally consider the reference service at a small public library a source of indepth information. The majority of questions asked by these online service patrons are highly technical and complex. Reference librarians at the public libraries participating in Project DIALIB indicated that they would not be able to answer such questions without the assistance of an online service.

(5) The initial provision of free searches to patrons, along with an active publicity campaign, seems to have had a strong impact on search volume. The four Project DIALIB libraries completed nearly 1,000 free searches during the first 6 months of operation. In contrast, libraries providing full-cost service to patrons (see Appendix D of Annex 1) without an initial free period or attendant publicity campaign indicate a relatively low volume of search requests. The available data do not allow a determination of the relative importance of these variables (free search period, publicity campaign) either individually or in combination.

(6) The allocation of reference service staff time is one of the most important factors to be considered in planning an online search service. As indicated earlier, public librarians in small public libraries do not normally perform indepth reference searching on the types of technical questions submitted by online service patrons. Computer searching on such questions and related tasks are too time consuming to be simply added on to such a public librarian's reference duties. If such a service is added without proper provision for staff time, other reference duties and/or services may suffer from neglect. In addition, inadequate staff time for an online service adversely affects search volume and turnaround time. Overworked staff are also more likely to be hostile toward the introduction and subsequent operation of a new service.

(7) To maintain search proficiency, online searchers must complete some "critical mass" of searches each month in each data base for which proficiency is desired. (It is not possible to determine optimal upper and lower limits on this critical mass from the available data.) Project DIALIB searchers who completed relatively few searches in one month felt less competent at online searching than did more prolific searchers. They felt that "hands-on" experience was required to maintain familiarity with data base organization, optimal search strategies, and data base content. On the other hand, a librarian overloaded with an exorbitant number of searches in 1 month may find that time limitations imposed at all stages of the search process (including query negotiation, online search time, and relaying of citations to the patron) may affect search quality.

(8) The problem of maintaining familiarity with all data bases is one of the most difficult problems faced by reference librarians conducting online searches. Project DIALIB librarians, who assumed responsibility for conducting searches in all data bases, felt generally that their search competence increased with data base familiarity. The proliferation of data bases makes it extremely difficult for one person to maintain a thorough knowledge of each new data base. Project DIALIB librarians felt that, like the hard copy reference tools, many data bases have a relatively unique organization and content, and that significantly compounds the problem. There are two possible approaches which may help to alleviate this problem. An organizational approach would be to make each reference librarian responsible for maintaining expertise on a limited number of data bases rather than trying to cope with all of them. Project DIALIB librarians did not use this approach because reference librarians work in shifts (an "expert" in a particular data base might not be on duty when needed for a particular search), and particular "experts" would be unavailable while on vacation. A training approach would be to develop better instructional materials describing the organization, content, relevant keywords, and optimal search strategies for each data base. The absence of such instructional materials was one of the most persistent complaints expressed by Project DIALIB librarians.

(9) The amount and quality of general training in online system operation may also affect the successful operation of the service. Most searchers believed that the initial training sessions alone were not sufficient for optimal system utilization. They felt that either additional training sessions were required after searchers gained familiarity with system operation or that training manuals should be made available to assist searchers as they gain expertise. Almost all staff felt that better searcher-oriented instructional materials for DIALOG should be developed.

(10) The attitude of the head reference librarian toward the service seems to have had a substantial impact on the speed and efficiency with which searches were completed. Librarians at all libraries found that provision of an online search service imposed additional demands on their time. However, at those libraries at which head reference librarians had a strong positive attitude toward the service, more searches were completed and were done in less time than at libraries where this attitude was missing.

(11) The major effect of the shift from a free to a fee-based service was a reduction in the volume of search requests. (Current trends indicate, however, a steady increase in search volume during the pay period.) Some shift was also observed in the allocation of staff time to various steps in the search process. During the pay period, staff attempted to reduce connect time (and subsequently the cost of the search to the patron) by spending more time offline preparing for the search.

(12) Finally, the provision of an online search service has done little in the short-term to alter the image of the public library in the community it serves. The principal impact of the service has been on professionals in both business and industry and on college students, all of whom have been particularly impressed by this new service being offered through the public library. These users seem to view the public library as being more innovative and progressive than they had considered it to be prior to the implementation of the online service. Most municipal government officials have taken only cursory notice of the public libraries providing online search services. In spite of considerable effort on the part of DIALIB librarians to provide government agencies with demonstrations and/or free searches (even during the pay period), a few such agencies actually made use of the service. However, government agencies in San Jose did make use of the service and at least one government official did note that a public library might be capable of providing support reference services for government agencies.

• • •

The process of changing an image or increasing public awareness of the role or function of the public library is a long, slow process. It is certainly much too soon to suggest what the long-range impact of an online service might be on either the public library or the community. In particular, one of the key questions remains unanswered: Can online search sustain itself in the public library after all subsidies have ended? The final report to be produced in the Fall of 1977 will be of particular interest, since it will cover not only the June 1976 – May 1977 period in which the only subsidy was the terminal rental, but will also indicate what happens when the terminal subsidy is removed.

(Summit & Firschein, p. 4-1 to 4-6)

The key role of the public library in a New Jersey information network goes back to 1964 when the New Jersey Library Association's (NJLA) Library Development Committee (LDC) issued a report titles "Libraries for the People of New Jersey or Knowledge for All." The LDC committee was chaired by Lowell A. Martin and Mary V. Gaver, and the report is often called the Martin-Gaver study. The study defined a hierarchical network of three levels of libraries: 1) local facilities consisting of local community libraries, elementary and secondary school libraries and college libraries, 2) area libraries, and 3) specialized and research libraries. (Martin and Gaver, p. 42-43) The 23 area libraries defined in the study were to be served by expanded service from 21 existing public libraries and one college library (Glassboro State). The specialized and research libraries were to be corporate libraries (the RCA and Public Service Company libraries were mentioned). (Ibid. p.53) Martin-Gaver saw the network they described as a pyramid with information flowing upward to a Library Reference and Referral Center established in the State Library "as an instrumentality of the third level of service, to channel and direct requests flowing up from local and area libraries....it would direct traffic to the network of resources over the state." (Ibid. p.55) The vital leadership role of the State Library in making the network function effectively was emphasized throughout the report, and a special section of the report was devoted to this. The section concludes: "It is the state agency which must continue to exercise leadership in continuous planning for development, by means of collecting thorough statistics and issuing reports promptly, of encouraging experiments and research into unsolved problems, and of stimulating and guiding planning." (Ibid. p.59)

In 1964, the concept of networks was in its infancy, budgetary limitations were not as constrained as today, resource sharing was an ideal instead of a necessity. Martin-Gaver pointed the way and emphasized the need for state planning and leadership.

Their report was followed four years later by "Suggested Recommendations for Interlibrary Cooperation in the State of New Jersey" by Joseph Eisner (February 9, 1968). The Eisner report contains several interesting recommendations relating to the feasibility of implementing an online data base search service in the New Jersey library network. In 1968, Eisner recommended that lateral/horizontal referral between area libraries be established. This was an expansion of the upward/vertical borrowing suggested by Martin-Gaver. His report also recommended the establishment of a teletype network between area libraries (including the State Library). (Eisner: 1968, p.10) The Eisner report recommended that the Area Libraries be encouraged to facilitate more on-site research at local libraries (Ibid. p.16) Eisner's recommendations for patterns of cooperation between the Area Libraries and the Research libraries are pertinent today:

1) Consideration be given to requiring training courses to be taken by non-professional staff members in libraries serving under 10,000 if libraries are to qualify to receive State-aid.

2) Consideration be given to preparation of materials for workshops to be used by Area Libraries for training of local library staffs and trustees.

3) Consideration be given to encouragement of creation of federations of libraries where it is not possible to designate area libraries.

4) Consideration be given to encouraging area libraries to adopt objectives leading to creation of systems of library services. (Ibid. p.20)

Like the Martin-Gaver report, the Eisner report also emphasized the necessity of the State Library's assumption of a leadership role "by making clear that as a matter of State policy, its intentions are to create systems, and it should make somewhat clearer to the area libraries what this implies." (ibid. p.23) Eisner suggests the feasibility of cooperative federations of libraries, especially in South Jersey. He even cites existing New Jersey statutes 40:5A-1 which make this possible.

Eisner's recognition of the need to strengthen areas of the state where resources are limited was also perceived by Ralph Blasingame. Blasingame addressed this need for change in a speech on "The Potential Role of the State Library," part of a 1969 symposium on State-wide Library Planning. (Gaver, ed.: pp.97-110)

In January, 1976, the Gallup Organization Inc. provided a study of "The Use of and Attitudes Toward Libraries in New Jersey." Several hypotheses, partially confirmed by that study, are relevant to this study of the feasibility of access to online data bases:

1. A major motivation for using libraries is their value for research and information seeking. (ibid. p.5-10)

2. The use of public libraries falls into a few categories, primarily the use of reference facilitites, book borrowing, and reading. (ibid. p.5-11)

3. When informed of the types of services that are available in public libraries, large proportions expressed definite interest in each even though few are now using these services. This suggests they are not now aware of these services, let alone knowing how to use them. (ibid. p.5-13)

The Gallup study recommended that the State Library investigate the distinction between "research" and "information seeking" and find out which particular segments of the population are motivated by each. (ibid. p.5-17) The study, in the section on policy implications, stressed the importance of <u>developing and publicizing</u> interlibrary loan services in

full resource reference centers and in the neighborhood libraries. (Ibid. p.5-14, 14a)

In Summer 1977, the Library Development Committee of NJLA offered an interim report for discussion which assessed recent library development activities in New Jersey and proposed a set of "interim goals." These goals specifically pointed out the need for the provision of additional and more specialized materials and services at the intermediate service level (the area library level). The goals also specify that all library resources be compatible and "efficiently connected to the broad resources of library networks nationwide." (Ibid. p.23) Nationwide, today's library networks are all efficiently connected by mutual use of several online data bases.

In February 1976, CAPTAIN Library Services, Inc. asked Jay K. Mall to survey the major U.S. library networks to assess the sources of their funds. The sources were to include sources of initial capital as well as sources of continuing support. Each network provided this data to Dr. Mall in confidence with the understanding that the data would not be published or used outside of the N.J. Department of Higher Education.

The Mall survey included 17 major U.S. library networks and found that 82% of these networks provided their members with access to computerized online bibliographic data bases. In 1976, the median age of networks surveyed was three (3) years. The older networks were often oriented toward academic and research libraries with large collections. The newer networks include all types of libraries. Initial funds for network development have come mainly from the individual states and from the Library Services and Construction Act. The states have continued to fund 35% of network projects. On-going funds for network operations come from network members, with 65% of network members contributing to

overhead support costs in addition to paying usage costs. The median network consists of 22 members. Alone among the major states in the nation, New Jersey was not, in February, 1976, actively involved at the state level in supporting computerized, online bibliographic control to improve efficiency in technical services and to augment public services.

In December, 1975, the Library Development Bureau provided $16,500 of Library Services and Construction Act funds to the State Library's Governmental Reference Office and the Reference Referral Office for a demonstration project to test the reference capabilities of a variety of commercially supplied data bases. Contracts were established with two corporate jobbers previously referred to, SDC and Lockheed. The first quarter report described the project as proving productive and successful in providing information. The information provided was the more valuable because it could not have been easily acquired through other sources, or, in many cases, was not available at all except through online computerized sources. Subsequent quarterly reports continue to describe progress in educating users in New Jersey. Reference requests are handled from special libraries as well as public libraries. The reports also tell of memoranda from members of state agencies testifying to the usefulness of online data base searching in providing information for their work.

The interest of special libraries and governmental agencies in online services has been flourishing. In 1975, the Special Libraries Association Student Group at Rutgers produced a preliminary directory of online data bases available in New Jersey. The medical libraries have had access to MEDLINE (Index Medicus online) through their regional medical libraries for several years. The rapid delivery of requested documents from a MEDLINE search has been a topic of discussion in the New York

and New Jersey Regional Medical Library located at the New York Academy of Medicine. Medical libraries in South Jersey do not feel that the delivery service is sufficiently rapid and have joined in a consortium called Southern New Jersey Health Science Librarians. This formal medical consortium and other loosely organized New Jersey medical library federations have recently been described for the New York Academy of Medicine by Robert Lentz. These federations have emerged for the reasons predicted by Eisner in 1968 when he urged the State Library to create and encourage such federations. One major reason for these libraries to federate is to share resources and to shorten the time required for interlibrary loan (ILL) document delivery. To the public and academic librarian document delivery means "book". To the special and medical librarian, document delivery means "journal article". This distinction should be kept in mind by the State Library as it works to encourage more online access to bibliographic resources.

Recently, in 1978, the State Library funded the establishment of a state union list of serials for the New Jersey public libraries to enlarge the area lists available locally now. Eventually, this list should be available online and, hopefully, in the near future the serials lists of all New Jersey libraries (school, academic, special and public) will be accessible online for location and ILL purposes. At least two area libraries are also exploring the feasibility of online access to computerized data bases. Camden County library and Cherry Hill public library are looking at OCLC for cataloging purposes. Ocean County library has just signed a three year contract with the Ocean County College Information Network for the design and development of a new automated circulation system called "P!STOL" (Public Information System Totally On-Line). The system will tie together all nine library branches, the headquarters

library and two bookmobiles. It will eliminate the need for the card catalog in the headquarters library and the nine branches. In addition, the system is designed to allow patrons to access the terminals to determine what continuing education programs are available in the county, what public service organizations serve their needs in the county, what organizations and clubs operate in the county and who are the officers and where the clubs meet. Furthermore, Ocean County College and the Ocean County Library will join forces to allow Ocean County residents to take three computer-assisted instruction programs at any one of the nine branches or headquarters within the library system. PISTOL's impressive range of public services is equalled by an equally impressive range of technical services: online cataloging for all resources and provision of online cost data to be used for a management information system for current decision and future planning purposes. "The library plans for this system to be the most unified and comprehensive information network in the United States."

Networking in New Jersey has evolved rapidly in the 14 years since the Martin-Gaver study. The questions now are not "Is it feasible?", but "How much will it cost?","How can an online network be funded?", "What is the most effective network configuration?", "What are the most natural areas of federation?", "How will these areas interface with each other for rapid access to information located anywhere in the state?". A recent nationwide advertising campaign for Xerox services describes information as a resource which is growing "almost uncontrollably.... Consider: Seventy-five percent of all information available to mankind has been developed within the last two decades. Millions of pieces of information are created daily. And the total amount is doubling every ten years. The problem, as with any crisis, is one of management."

The current challenge to the State Library is to manage and to integrate the developing regional networks into a state-wide library network which indeed provides 'Knowledge for All". Access to periodical information will be just one product of this network.

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X. APPENDICES

APPENDIX A

RUTGERS UNIVERSITY, GSLS, BLISR

Periodical ILL Study of Feasibility of Online Bibliographic Access in New Jersey Area Libraries - For N.J. State Library

Interview Guide for Reference and ILL Personnel
in
23 New Jersey Area Libraries

March, 1978
April, 1978

LIBRARY _____ CASE # _____ DATE _____

I. PERIODICAL COLLECTION CHARACTERISTICS:

1. What do you consider especially strong subject areas in your periodical collection?

   a).....

   b).....

2. How many periodical titles does the library receive? .....
   (include newspapers and gift subscriptions)

3. How long do you store back titles and/or issues in hard copy, i.e., inkprint? .....

4. Do you purchase back titles and/or issues in microform? Yes ... No ...

5. Does your area have a union list of periodical holdings?

   Yes ... No ...

6. Are holdings from the following types of libraries included in your list?

   a) Local Public Libraries — Yes ... No ...

   b) Academic Libraries (include community college & university libraries) — Yes ... No ...

   c) Special Libraries — Yes ... No ...

   d) Elementary and Secondary School Libraries — Yes ... No ...

7. Does your area have a directory of libraries in the area other than the Union List? Yes ... No ...

   a) If YES, are special collection strengths in particular subject areas included in the directory?
   Yes ... No ...

II. ILL AND PHOTODUPLICATION PROCEDURES

1. Do you send patrons directly to a nearby library for a needed periodical article, provided the patron is willing, before initiating formal photocuplication procedures to obtain the periodical article?

   Yes ... No ...

2. Do you work closely, on an informal basis, with any of the following types of libraries in your area?

   a) Local public libraries Yes ... No ...

   b) Academic libraries Yes ... No ...

   c) Special libraries Yes ... No ...

   d) Elementary and Secondary School libraries Yes ... No ...

   e) If YES, please specify which libraries and the type of working relationship.

   .....

3. Do you verify a periodical reference for photoduplication forms?

   Yes ... No ...

III. IN-DEPTH, UNSTRUCTURED QUERIES FOLLOWING INFORMATION ELICITED FROM QUESTIONS IN PARTS I & II

APPENDIX B

LIBRARY PHOTODUPLICATION ORDER FORM

Requesting Library
Fill in form send sheets A and B to Supplying library.

Date of request:

Requester's Order No. .....

Supplier's Order No. .....

Call-No.

Author (or Periodical title, vol. and year)

Fold →

Title (with Author and pages for periodical articles) (incl. edition, place and date)

☐ Any edition

Verified in (or Source of reference)

Request ☐ microfilm ☐ photoprint ☐ Other Remarks:

NOTE: This material is requested in accordance with the A. L. A. recommendations concerning the photocopying of copyrighted materials.

ORDER AUTHORIZED BY:

REPORTS:

NOT SENT BECAUSE:
- ☐ Not owned by Library
- ☐ File is incomplete
- ☐ In use
  - ☐ Hold Placed
  - ☐ Request again
- ☐ Publication not yet received
- ☐ Please verify your reference
- ☐ Other:
- ☐ Suggest you request of:

Estimated Cost of Microfilm .....
Photoprint .....

Please pay in advance ☐
Please do not pay in advance ☐

Please send cost estimate for
☐ microfilm ☐ photoprint

Go ahead with the order if it does not exceed: $ .....

Special instructions:

← Fold

A

Request complies with
___ 108(g) (2) exhibits (CCG)
___ other provisions of copyright law (CCG)

Supplying Library
Fill in pertinent items under REPORTS; return sheet B to Requesting library.

CAT NO. 23225 BRO-DART INDUSTRIES

APPENDIX C

INFORMATION NETWORK PROJECT

AN INVESTIGATION
OF THE FEASIBILITY OF IMPLEMENTING
AN ONLINE DATA BASE SEARCH SERVICE IN THE
NEW JERSEY LIBRARY NETWORK

PHASE I

STUDENT STUDY OF AVAILABILITY OF PERIODICAL TITLES

Prepared with the Assistance of

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By:

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January 16, 1978

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AN INVESTIGATION OF THE FEASIBILITY OF IMPLEMENTING AN ONLINE DATA BASE SEARCH SERVICE IN THE NEW JERSEY LIBRARY NETWORK

Abstract

This project investigated the feasibility of using commercially available bibliographic data bases in N.J. libraries. We were interested in the implications of this to the existing N.J. library network and to the 1976 plan, "Networks for Knowledge." Some of the questions we attempted to answer were:

--whether the use of on-line data bases can be superimposed on the existing N.J. library network

--whether on-line data bases are worth the cost

--what effect would on-line data base use have on ILL throughout the state

--what the implications are of the present lack of lateral borrowing in N.J. libraries on on-line data base use.

The study was conducted in three parts:

Part 1: Data gathering -- A number of hard-copy indexes which are available on-line were examined and a 1% random sample of the journals they index was taken. N.J. state colleges, area, county, and local libraries were visited to discover their holdings of these 1% journals.

Part 2: Literature search -- The library network plans of many states were examined (especially those states demographically similar to N.J.) in order to compare their networks to the existing and proposed N.J. networks. Special attention was given to states which were using on-line data bases in their network. N.J. library use was studied through reading the Gallup study and the N.J. Public Library Statistics.

Methodology

The first step in this project was to study the availability of periodicals indexed by the data bases of Lockheed and SDC in academic and public libraries in New Jersey.

1) A sampling of indexes found in the two data bases was taken (12 total: 12 Lockheed, 6 SDC). These indexes were then divided among the students, and each student had one or more indexes to search.

The journal sampling process involved finding the most up-to-date "list of journals indexed" available for the hard-copy indexes which correspond to our sample of twelve data bases. We then determined the number of journals on the list. At first we planned to take a 10% sample but since the total number of journals was approximately 24,000 we lowered it to 1%. Systematic sampling was used. Using a random number table we chose a number between 1 and 100, counted to the random number on the journal list, copied the name of the journal, and continued for every 100th journal on the list. The names of the journals, along with the index listing them, were placed on "3 x 5" index cards.

Each student checked his/her 1% sample of journals against the Union List of Periodicals at the New Jersey State Colleges and the Rutgers University Libraries (including the CHEN Member Libraries, the New Jersey State Library, and the Newark Public Library), 1975. The location symbols of the libraries were written on the card for each journal. Also, each journal was searched in Ulrich's, New Serials Titles, and/or the LC Union List of Serials to determine when it began publication.

The data on the cards was then input into the computer via OSLS terminals and tags to allow sorting were attached to the following fields: title, index, date, location. The group was then sorted by title and each student received a print-out of the list.

The second step of the study involved each student using a New Jersey library for data gathering regarding the availability of journals from the sample list and the statistics for interlibrary Loans (ILL) in the libraries surveyed. The libraries used in this study were:

East Brunswick Public
Fairleigh Dickinson University (Teaneck)
Middletown Public
Montclair Public
Montclair State College
New Brunswick Public
Paterson Public
Princeton Public
Summit Public
William Paterson College

2) Each student took the print-out of the journals to one or two libraries which were chosen because of their locations--they were within reasonable driving distance from the residences of the students. The journals on the print-out were checked against the journal holdings of the libraries. In addition to the holdings of the ten libraries visited, and the eighteen libraries in the Union List of New Jersey colleges and Rutgers, a visit was made to the State Library in Trenton where ten separate area and county union lists were checked against our print-out.

Each library was asked to allow us to view their ILL request slips for 1976, the year for which journals were calculated for each library.

The third step of the project was the literature search. State plans for the library service were examined for thirteen states across the country (Appendix 3). The plans of these states were compared to the 1964 and 1976 New Jersey plans. Nine aspects of the networks were compared and have been compiled into a chart (Appendix 2). Also, both of the New Jersey plans, "Libraries for the People of New Jersey" and "Networks for Knowledge," 1976, as well as a report prepared by a consultant, Joseph Elsner, "Suggested Recommendations for Interlibrary

Cooperation in the State of New Jersey," 1968, were read and analyzed. Criteria for selection of state plans were the availability of not-too-outdated plans either in Alexander Library or the Bureau of Library and Information Science Research. Available data bases such as Lockheed's DIALOG, the Information Bank, and SDC provided literature to be surveyed.

Limitations of the Investigation:

Limited access to current state library plans of other states resulted in a restricted literature search.

Limited budget restricted the number of aspects that could be investigated and the depth of investigation.

PART 1: DATA GATHERING

List of Indexes	Data Base Vendors
1. Library and Information Science Abstracts	Lockheed & SDC (forthcoming)
2. Science Citation Index	Lockheed
3. Biological Abstracts	Lockheed & SDC
4. Psychological Abstracts	Lockheed
5. Historical Abstracts	Lockheed
6. Meterological and Geostrophysical Index	Lockheed
7. Social Science Citation Index	Lockheed
8. CIIE	Lockheed
9. Language and Language Behavior Abstracts	Lockheed
10. Engineering Index	Lockheed & SDC
11. Chemical Abstracts	Lockheed & SDC
12. Pollution Abstracts	Lockheed & SDC

Name of Library Used for 1% Sample	Journals Held by Libraries Taken from 1% Sample	
	No.	Rank
1. East Brunswick	3	6
2. Fairleigh Dickinson University (Teaneck)	47	1
3. Middletown Public	2	8
4. Montclair Public	11	4
5. Montclair State	27	3
6. New Brunswick	2	8
7. Paterson Public	5	5
8. Princeton Public	0	10
9. Summit	2	8
10. William Paterson College	34	2

The data gathered in steps one and two regarding libraries' holdings of the sample journals and ILL borrowing of journals was compiled from each student's list into summary charts and graphs. These charts and graphs are presented on the following pages.

* Names of Libraries Included in Column 1 - Local and College Libraries in the Study.

East Brunswick

Fairleigh Dickinson University (Teaneck)

Middletown Public

Montclair Public

Montclair State College

New Brunswick Public

Paterson Public

Princeton Public

Summit Public

William Patterson College

Plus All Libraries on the New Jersey Union List

** Names of Libraries Included in Column 2 - Area and County Libraries in the Study.

Bloomfield Public Library

Hackensack Area Library

Hunterdon County Area Library

Linden Area Library

Middlesex County Library

Monmouth College

Morris County Library

Ocean County Library

Somerset County Library

Trenton Area Reference Libraries (includes public, school & special libraries)

Plus All Libraries Mentioned Above

ILL Borrowing of Journals

Out of the ten libraries visited, ILL data for 1976 was unavailable at five. Of the remaining five, we calculated what the percentage of total interlibrary borrowing was with regard to journal requests:

Princeton Public Library	--	1%
Middletown Public Library	--	3.1%
East Brunswick Public Library	--	3.8%
Paterson Public Library	--	10.6%
William Paterson College		56.4%

These figures imply that there is not much borrowing of journals in the public libraries, but we believe that the figures may not be generalizable throughout the state. One reason is that all of the libraries studied are located in the northern half of the state in densely populated areas. Three of the libraries were located in close proximity to a county or university library to which patrons were referred for journals (Monmouth County Library -- Eastern Branch; Princeton University; Rutgers University). Two libraries, Paterson Public and William Paterson College, were located in the same town and patrons could be expected to make use of the holdings of both.

PART 2: LITERATURE SEARCH

Data Base Vendors

Lockheed - DIALOG:

- Over 40,000 different journals covered.
- Average search time in one data base is 10 min.
- Beginners usually require 15-20 min., but time per search decreases with experience.
- Telenet communications are now 5.00/hr (8.3¢/min.) (8.00/hr).
- If one can dial directly, there is no charge made by Lockheed for communications.
- The cost of offline printing normally 10¢ per full record for traditional indexes (ERIC, NTIS, etc.).
- Lower rates for lesser portions of record - 5¢ for citation and index terms, 4¢ for title and abstract number.
- Largest academic institutions generally have access at least through one library.
- All school systems have access through the New Jersey Occupational Resources Center in Edison and through the Educational Center Northeast in East Orange.

The Information Bank: an information service of the New York Times Company.

The information bank is a storehouse of information on literally thousands of general subjects. The user is able to search the data base in a matter of seconds. Included are over 70 major publications from the U.S. and other countries. There is an hourly fee for computer access time. Included are circulation newspapers (ex. Chicago Tribune, Christian Science Monitor, Newsday, NYT), business publications, foreign affairs, science publications and newsweeklies, monthlies, quarterlies. These are mainly popular periodicals such as Atlantic, Black World, Ebony, McCalls, Newsweek, Sports Illustrated, etc.

SDC--Systems Development Corporation: an online retrieval system for access to one of the largest families of online literature and reference data.

- Effective search in as little as 5 or 10 minutes.
- Three price elements:

  1. Computer time period
  2. Communications usage
  3. Off-line printing.

- According to an online impact study (1975) 0% were public library users, but nearly 80% of managers work in libraries or information centers.

- The largest group of searchers, 77%, consists of librarians and information specialists.
- Location of terminals in separate terminal rooms within the library or information center.
- Most searchers received formal training from online system suppliers.
- Average cost per search:

26.5% - $ 1.00- 9.00	5.9% - 40.00-49.00
20.9% - 10.00-19.00	12.8% - 50.00-99.00
15.0% - 30.00-39.00	

- Network entry points:
  N.J.: Englewood Cliffs, Newark, Union, Wayne.

Investigation of the Public Library as a Linking Agent to Major Scientific, Educational, Social and Environmental Data Bases

Two Year Interim Report, October 1976
Lockheed Information Systems Programs.

This report represents the results of the first two years of the DIALIB project to investigate online searching in a public library setting. Four public libraries in Northern California were the original participants, four others in other parts of the country were added in the middle of the second year. The service provided was access to Lockheed's data base DIALOG. The first year it was free. The second it was available at half the cost, the last year at full cost. This report represents the first two years, but indications are that the last year will follow the pattern already established by May 1977. The great decline in use was when the service switched from being free to being for a fee--the amount of the fee involved has not, so far, caused a big drop in use.[1]

The libraries in the project were:

San Jose Public
Santa Clara County Public
Redwood City Public
San Mateo County Public
Minneapolis INFORM System
Long Island Library Resources Council
Houston Public
Cleveland Public

When fee for service started in June, 1975, the number of searches dropped to 10% of the previous number, then slowly increased:

Sept. 1974	May '75	June '75 (fee starts)	May '76
55	300	29	77

[1]Note from Oscar Firschein to Karen Lee, May 1, 1977.

FREE PERIOD	FEE PERIOD
1920 searches (average 90/month)	747 searches (24/month)
22 min/search	15.9 min/search
14.27 online citations	3.42 online citations
55.83 offline citations (Note: this is inconsistent with later figures that give the average number of offline citations as 1-5)	88.9 offline citations
Most popular data bases: ERIC, NTIS, Psych. Abstracts, SSC, EI.	
Little offline preparation time	Much offline prep. time
$28.41 average cost (20% was staff time)	$9.33-$20.56 (not counting staff time)
College libraries provided 33% of documents	College libraries - 46%
Library where search conducted provided 30%	Library where.... - 22%
33% searches were job related	33% job related
33% research papers	43% research papers
70% satisfied customers	70% satisfied customers
18% no useful citations	13% no useful citations
10% 21-50 useful citations	21% 21-50 useful citations
30% 1-5 useful citations	30% 1-5 useful citations

Users were graduate students, educators, technical professionals and librarians. 60% of all search patrons had more than 4 years of college. Only 7% of online patrons were regular library users; 60% used reference services infrequently. Most patrons came from outside the community; 54% had library cards elsewhere. 36% had library cards at the library where search conducted. Therefore the online data service had little impact on the home communities and did not improve the library's image with its main source of financial support. Municipal governments were offered online data base service but did not use it.

Notes:

DIALIB provided an increased reference service to new patrons and if the library staff was not increased the drain on the reference staff was considerable. One library estimated that for every minute online the librarians spent three minutes preparing the search. Again and again the libraries in the experiment pressed the point that online service would not work unless there was enough staff. They also pointed out that for a public library used to handling general reference questions the DIALIB with sophisticated technical and complex questions for which they were not accustomed to preparing search strategies. They felt the adjustment to online searching might be easier in a library where the staff was already conducting manual searches in indexes similar to those online.

There had not been any problems locating the source documents for DIALOG citations, though the libraries had expected there might be. The report does not describe how the documents were located.

Areas with highly educated professionals provided most of the customers. The highest volume in main libraries was walk in and telephone contact.

The use of DIALIB seemed to be a function of what other information services were available in the area.

DIALIB customers were new to public library reference service.

The initial free period was necessary to drum up customers.

The libraries must supply adequate librarian support time: Inadequate time affects turnaround time and volume. Overworked librarians become hostile.

There must be some critical mass of searches/data base: Too few and the librarians get rusty, too many and the interim problems become overwhelming (question negotiation, filling out request forms, billing, etc.).

The librarians had trouble keeping up with so many data bases, all of which require individual strategies.

The New Jersey State Library Plans

In 1964, Lowell Martin and Mary Gaver published the New Jersey State Library plan, Libraries for the People of New Jersey, or Knowledge For All. This proposed a three tier model of library service: at the local level, within 20 minutes from their homes, citizens would find local libraries whose minimum standards would require 25,000 volumes of which 8,000 would be for children. One thousand books would be added each year and 75 periodical titles would be maintained. There would be one librarian and one clerk for each 5,000 people and a children's librarian who would provide 30 hours of direct contact with the children each week. These libraries would have to be open at least 48 hours a week and would provide 60 seats. They would provide some reference service, but the main reference responsibility would be at the area library level.

There were to be 22 Area Resource Centers, which would be developed from existing libraries serving between 200,000 and 500,000 people. These libraries would have at least 150,000 volumes and would provide good reference service and bibliographic facilities. Five thousand volumes would be acquired each year plus non-book materials. Three hundred and fifty subscriptions to periodicals would be maintained, and the back issues filed for ten years. There would be at least 8 professionals and space for 150 readers. The Area Resource Centers would be open 68 hours a week.

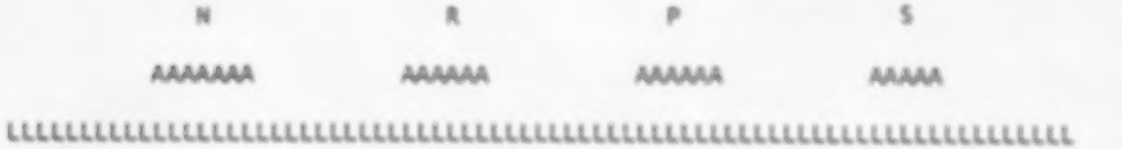
It was mentioned in the proposal that "a plan (was) needed" to develop subject specialities and work in networks, but there were no funds allocated for such networks and no description of how they were to be organized. It was suggested that a central referral point was necessary to which area

libraries could address questions. This agency would act as a coordinating instrument.

The State Library would be given increased responsibilities: a Library Reference and Referral Center would channel requests from local and area libraries and consultants would be provided to work with public and school librarians to improve services. It was proposed that six individuals hold these jobs, one for each of two or three Area Resource Centers. The Reference Center would be able to answer very sophisiticated reference requests and would also direct requests to other libraries--in New Jersey where possible and out of state when necessary.

Newark Public Library would be both an Area Resource Center and the Metropolitan Reference Center of Northern New Jersey, for which it would receive increased state support.

It was pointed out that coordinated plans must be developed to allow New Jersey citizens further access to research resources and specialized reference collections. Eventually, a third level of library service was established which provided reference service when the Area Resource Center was unable to answer a question. This tier included Newark Public Library, Rutgers University Library, Princeton University Library and the State Library at Trenton. The model looks like this:



There are now 25 Area Resource Centers, four Resource libraries and countless local libraries. A disadvantage of this plan is that it is hierarchical and questions must be directed upward, not laterally.

This plan was addressing itself to a number of problems. In 1964, New Jersey was 24th in the number of books per college student and library support per student. Not counting Princeton, the rankings would have been 45th and 50th respectively. The State Library was underfunded. There was no existing network at the area library level, and there was a need for networks to coordinate library service all over the state (though the plan is very vague on just how the networks should be developed). Most of all, there was a need for more money! The proposal pointed out that proper financing would involve almost doubling existing funding from $17,000,000 to $30,000,000. This would be partly multiplying the state's share of the budget by six times, bringing it to 2%.

In 1967, Joseph Eisner, a professional library consultant from Long Island did a study of the New Jersey system in order to improve network facilities.[2] He made a number of recommendations which include the following:

In order for Area Resource Centers to cooperate, there should be new staff assigned trained specifically to be useful to cooperative activities such as consultative assistance on films, weeding, collection development, budget preparation, etc. Two or more libraries might share consultants. Experience in Pennsylvania and in New York State indicated that when libraries consolidated into networks there had to be a good deal of staff retraining, because the skills and abilities necessary to administer a library network were often very different from the skills already possessed by the reference librarians or administrators on the staffs of individual libraries. Eisner felt it would be wiser for

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[2]Eisner, Joseph. Suggested Recommendations for Interlibrary Cooperation in the State of New Jersey. Library Consultant Services. February, 1968.

the libraries to anticipate this and bring in people to act as network consultants rather than just change some of the duties of the existing staff.

Elsner also suggested that all research libraries, the Area Reference Centers and the State Library be linked by teletype. This way they could exchange information on periodical holdings. Indexes could be purchased by local libraries and patrons could teletype members to see who might provide the journal cited. Elsner thought research libraries should exchange information on the scope and limitations of their acquisitions profiles so that the Reference Referral Service of the State Library would know who was likely to be helpful in what subject areas (he cited, for instance, one library which collected material on organic chemistry but not on analytical chemistry). He suggested that libraries consolidate long broken runs of newspapers and periodicals which are now scattered in libraries across the state to make a microform master copy and to consider whether it is better for one library to house an entire run.

Elsner suggested all libraries within an area insist on the same discounts from jobbers. He mentioned that this could make a big difference to small local libraries who didn't have enough clout on their own to make deals but who would benefit most by the extra few hundred dollars such a policy might bring in. He suggested the State Library provide advisory services to Area Resource Centers so that they could advise local libraries. He suggested the State Library fund cooperative federations of libraries and that federations be created in areas where it was not feasible to designate Area Resource Centers. In fact, he advised that the concept of Area Resource Center be reconsidered and they be replaced by federations of libraries with lateral reference facilities and reciprocal borrowing.

In 1977 the preliminary plan Networks for Knowledge, or Mobilizing Libraries for the People was distributed to the Library Development Committee of the New Jersey Library Association. It addressed itself to certain problems that had evolved as the 1964 plan was implemented. It pointed out certain problems with the present plan and proposed solutions.

The problems included the following: local governments were being forced to make up for cuts in state funding and were having trouble doing so. Area Resource Centers in urban areas were suffering particularly. The per capita sliding scale funding did not provide enough money--it was suggested the state do more. Most funding for New Jersey libraries was inadequate. Advisory councils should be given strong roles in encouraging cooperation between academic, special and area libraries. Many of these problems pointed out the need for increased cooperation among New Jersey libraries.

The plan criticized the present funding formula for the Area Reference Centers. It felt that alloting funds on a per capita basis missed the point that research centers had a certain level of responsibility no matter how many people they served. It was mentioned that they should be given a basic grant plus a per capita grant. There were particular problems regarding the funding of those county libraries not acting as Area Reference Centers--and it was not clear just what their role would be in the general scheme of the New Jersey library system.

Certain services and experiments, such as films or computer technologies, needed a broader base of funding and service than Area Reference Centers could provide. Ways had to be devised to enter them into the general New Jersey plan and support them with state funds.

More research and planning needed to be provided for, done both through the Graduate School of Library Service at Rutgers and through the State Library.

The basic goals and objectives of library service for the state of New Jersey were much the same in the 1977 proposal as they had been in 1964, and the new plan was built upon the earlier one.

Citizens should have a local library within 20 minutes from home, and local public libraries should receive both local and state funds for local programs. Where the community was too poor to support library programs, state funds should bring the level of equalization up. The 1977 plan provided for contracts which could be drawn up between municipal libraries and between school libraries and municipal libraries to pay for mutual services. It encouraged greater cooperation among libraries within an area (but did not say just how this was to be effected) and was particularly eager to encourage an Interlibrary Loan delivery system and cooperative projects such as Union Lists, Cable Television compatible development of new technology and specialization in collection development.

Area Resource Centers should be within 45 minutes of citizens' homes and should serve contiguous areas. Reviews should be made of their activities every three years by a representative body of librarians in the area, and changes made following the recommendations of the reviews. The state should regulate additional and special services and materials (such as a film service). Research should be conducted to establish measures of performance for Area Resource Centers.

The 1977 plan recommended that all citizens have access to research collections. It advised the state to help support research collection and to regulate the provision of research services.

The plan recommended integrating all libraries in a coordinated network based on the three existing levels of service but broad enough for new ideas. It especially recommended new state and federal funds for experimentation with new technology and for ways to make new technology available to people all over the state. It recommended there be centralized or regional technical facilities where these would be cost-effective; it encouraged reciprocal borrowing but neglected to outline just how to initiate these services.

The plan recommended there be a new formula for per capita state aid which would reward communities for high local appropriations. This would increase state funding by 1/3, or by $2,500,000. It would extend the present state aid formula so that all communities would receive equalized per capita expenditures. This would give one third of the communities in New Jersey equalization funds at a cost of between 5 and 8 million dollars. It would give each Area Resource Center a $100,000 grant plus 30¢ per citizen. This would double the present allocation. The proposal would authorize $600,000 to libraries at the research level. It would create a Research and Development fund to be administered by the State Library for short term projects which would cost $500,000 per year--20% for Research, 80% for Development. Film centers, now being supported by the federal government would be funded at the state level. This would cost $740,000. It is unclear whether this would be a start-up cost or an annual one.

If all the recommended figures are added up, the plan would appear to recommend that $13,100,000 be allocated by the state for library service per year. In the year 1975-76, the state allocated $7,000,000. In that year, the state's contribution went from 17.1% to 13.1% of the total spent on libraries (not counting private, and special libraries).

The 1977 proposal recommends that the state contribute 23% of the funds for library service in New Jersey. (In 1975, $56,000,000 was spent on library service in New Jersey according to the proposal's figures. $13,000,000 is about 23% of $56,000,000. It is interesting to note that the 1964 plan suggested that state support should come to 24% of the total spent on libraries.)

Analysis of Literature Search

A literature search was conducted of several existing state library networks in an attempt to locate a suitable model to aid in the investigation of the feasibility of implementing an on-line data base search service in New Jersey. Of the thirteen states studied, only one uses on-line data bases at the present. California now uses DIALOG on an experimental basis. In addition, Arizona has an on-line data bank system whose function is unclear, and Washington utilized a state computer network system for technical services. Eventually both states hope to include on-line data bases in the state network. No other states provide a suitable model for New Jersey to pattern itself after.

However, the literature search did lead the investigators to the DIALIB study now being conducted by Lockheed and to the Gallup study of public libraries in New Jersey. The DIALIB study provided the investigators with the only comparative data on on-line data base use in public libraries that could be found. The Gallup study indicated that the present user population of New Jersey public libraries is different from the users attracted to DIALOG, through DIALIB.

PART 3: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Should public libraries bother to provide online services:

   a. In the DIALIB study it was noted that the clients for on-line services came from outside the community. Their questions diverted the attention of the reference staff from within the community. Using property tax funds to help outsiders might be politically ticklish.

   b. If serious researchers and students don't think of the public library as a resource, is it worth the expense of using on-line data bases to change this image? College and university libraries already have the clientele and the image of being the place to conduct research. The potential users of online data bases who are usually not connected with the university networks are in the business community.

   c. Within the funding structure of the New Jersey library system there is provision to refer "third level" questions to the four Third level libraries, Rutgers, Newark, Princeton, and the State library. Online data base searches seem to represent third level questions and could be funded accordingly.

2. If the colleges and university libraries plus Newark are interested in forming a network of online data base centers there are a number of advantages:

   a. Some are already linked through a union list of serial holdings which could be made more useful through the provisions of the Eisner report. Those libraries not included in the Union List should consider providing holdings data.

   b. If the libraries that we visited are any indication of the general trend in N.J., few of the 1% sample of journals covered by data bases are to be found in local public libraries in New Jersey. Significantly more of these journals were located in the few academic libraries visited.

   c. In the California study, 46% of the documents cited were found in the college and university libraries.

   d. If the state college libraries, the private college libraries, and the existing reference libraries were interested in providing online data base service to the state of New Jersey as a third level reference network, this would provide a network of libraries across the state.

3. If the potential for public library access to online data bases should be given further consideration, a pilot study might be conducted in which an existing public library federation, a non-federated area library and a college library system all introduce online data service on an experimental basis, funded by a grant, and make competitive use studies.

   a. Librarians trained in one library could offer training to librarians in other libraries and maintain workshops to keep skills up-to-date, and trade information on new data bases.

   b. The volume and nature of ILL problems could be studied.

   c. Comparative figures on search thoroughness etc. could be provided by using a control group of libraries not providing online service. This recommendation is being made to augment the DIALIB study and others conducted by online data base vendors.

4. Less expensive teletypewriter (telecommunications) network might be used to tie a few online terminals, located in resource centers, to public libraries throughout the state. Referral network would consist of four resource libraries (Rutgers, State Library, Princeton and Newark) plus one or two libraries in South Jersey, such as Stockton State College or Glassboro State College.

5. Online data base costs may be high, and under present economic conditions, may be too costly for most N.J. public libraries.

Recommendations

1. That we get more information on the following:

   a. In the East Bay area, public libraries are sending requests for online searches to U.C. Berkeley. What is the experience?

   b. Do some of the more public library oriented indexing services such as H.W. Wilson plan to make their indexes available on-line? These might be so useful as to make online services viable to public library networks.

   c. Just how useful is DIALOG as a reference tool in public libraries? How can performance be measured?

   d. Are there any online data bases covering Federal, State and local legal citations?

   e. Has anyone done a study to compare costs of doing an online search vs. a manual search of the same question to see if the time of the librarian is saved and/or if the number of useful citations increases? Results of such a study were: "that even a skilled clerk provided with the best manual tools would take between 500 & 800 times as long to do a typical search as the NLM online retrieval system requires."

   f. What is the volume of ILL generated by online data bases?

2. If fee for service is initiated, could individuals charge costs to Mastercharge or Bankamericard? Then could they be written off as business expenses? Also, it would make billing easier.

3. Unless sufficient demand arises, it might be too costly to place a terminal in each public library in New Jersey. Since journal resources and reference materials are located in Resource Centers and academic libraries, these would be logical choices for introduction of online data base service located in academic libraries is open to the public on the same funding basis that it is available to the public through the public libraries (whether this be partially subsidized, wholly subsidized or not subsidized at all).

4. Online data bases introduced into public libraries should: include indexes that are most highly used in public libraries (such as Reader's Guide, Business Periodicals Index....).

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APPENDIX I

PRELIMINARY
DIRECTORY OF ON-LINE DATA BASES AVAILABLE IN NEW JERSEY

by

SLA STUDENT GROUP, RUTGERS UNIVERSITY

CAPTAIN LIBRARY SERVICES, INC.
RUTGERS UNIVERSITY GRADUATE SCHOOL OF LIBRARY SERVICE
1975

APPENDIX 2

CRITERIA OF EVALUATION	ARIZONA	ARKANSAS
STATED PURPOSE	Total library service to all residents, including all special and disadvantaged groups.	To develop a statewide program of coordination of library services; to aid and establish county and multi-county systems.
TYPE OF LIBRARIES IN THE SYSTEM	Public libraries (future plans also include school, academic and special libraries).	Primarily public, but also acting as advisor to school library systems.
SUBSYSTEMS INVOLVED	Six (6) regional systems, eleven (11) county systems.	Thirty-three (33) county and multi-county systems of public libraries.
ADMINISTRATIVE STRUCTURE	Centralized under the Dept. of Administration.	Centralized under the Arkansas Library Commission.
FUNDING	Two-thirds of funding comes from the state, one-third comes from the federal government. 1972-73 total was $1,500,000.	Funding is preimarily done by local governments. For fiscal year 1974: local - $2,500,000; state - $500,000; federal - $1,000,000; revenue sharing - $500,000.
SERVICES OFFERED BY THE SYSTEM	Interlibrary loan and data banks for network programs. (AV acquisition and reciprocal borrowing are proposed.)	Computerized centralized processing of material, development of AV, ILL and cooperative purchasing of reference materials. Outreach programs to the very young and very old.
DOES THE SYSTEM WORK?	Present system seems to be working well. Immediate future plans are to further expand services.	Present system seems to be working well.
SPECIAL FEATURES	Demography of the state is a problem--one county has 127.1 people/sq. mile and another has 2.6 people/sq. mile.	A statewide union list begun in 1957 that now serves to locate over one million volumes.

CRITERIA OF EVALUATION	CALIFORNIA	COLORADO
STATED PURPOSE	To encourage libraries to organize into systems under provisions of Public Library Services Act.	To make all existing resources of all types of libraries and information agencies easily accessible to all users.
TYPE OF LIBRARIES IN THE SYSTEM	Large public libraries to receive most requests, state and university libraries to receive special requests.	Public libraries, the State Library, college and university libraries.
SUBSYSTEMS INVOLVED	Twenty (20) library systems, fifteen (15) are multi-library systems, five (5) are single. Regional intermediate libraries suggested.	One hundred and sixty-three (163) public libraries, and thirty-one (31) college and university libraries.
ADMINISTRATIVE STRUCTURE	Varies; by system chairman, by member libraries, by system coordinator, or by program or project.	The Colorado State Library.
FUNDING	Local funds - per capita grants of $.03+ rest to establishment grants. Federal funds are crucial. 1975 - $1,000,000.	Funding comes from the state legislature.
SERVICES OFFERED BY THE SYSTEM	Standard library services, including interlibrary loan and interlibrary reference.	Standard library services, including interlibrary loan and interlibrary reference.
DOES THE SYSTEM WORK?	Present system works fairly well but increased volume of ILL and interlibrary reference may cause a system breakdown. More money is needed.	At the present there is dissatisfaction with the system due to lack of proper administration.
SPECIAL FEATURES	Library systems have committed over half their funds to resource sharing. Projected figures indicate an ILL overload.	

CRITERIA OF EVALUATION	ILLINOIS	MISSISSIPPI
STATED PURPOSE	To improve library service through sharing of resources.	To save money through more efficient methods.
TYPE OF LIBRARIES IN THE SYSTEM	Primarily public libraries, although several university libraries act as Regional Reference Centers.	Public, academic and special libraries are all included.
SUBSYSTEMS INVOLVED	Eighteen (18) regional systems.	Recommendation that libraries should organize into larger systems, of greater than 500,000 people.
ADMINISTRATIVE STRUCTURE	Lateral.	Proposal to cut administrative costs by centralizing and having fewer administrators. Regional systems recommended to include public, academic and special libraries.
FUNDING	Primary funding is through local property taxes. State also gives aid in the form of one-time establishment grants, population and area grants.	One mil tax on property.
SERVICES OFFERED BY THE SYSTEM	Standard library services, including interlibrary loan.	Recommendations include telecommunications to broaden use area, centralization of technical services, home service to users, and so forth.
DOES THE SYSTEM WORK?	Present system seems to be working fairly well.	Unknown. (This factor not covered by the proposal.)
SPECIAL FEATURES		Proposal to store infrequently used library material in cheaper quarters (rented storage).

CRITERIA OF EVALUATION	NEW YORK	NORTH CAROLINA
STATED PURPOSE		To organize libraries into larger units to best utilize limited funds.
TYPE OF LIBRARIES IN THE SYSTEM	Primarily public libraries, but academic libraries are also included.	The State Library and public libraries.
SUBSYSTEMS INVOLVED	Nine (9) reference and research library resources systems, and twenty-two (22) public library systems.	Two systems proposed: 1. The State Library plus three state library branch offices, plus regional and local libraries, or, 2. The State Library and three to five strong cooperative systems.
ADMINISTRATIVE STRUCTURE	Lateral--a series of autonomous regional systems.	Centralized under the State Library (local libraries are under regional library groups which in turn are under branch offices of the State Library).
FUNDING		Proposed: $5,000,000/year plus State Library subsidies, matching funds of $1. for every $4. spent, and $30/square mile served (to compensate rural areas).
SERVICES OFFERED BY THE SYSTEM	ILL, Union List of Serials, compiled by the State Library, centralized book ordering and processing and in some cases professional consultation in formulation of policies and so forth.	Proposed: centralized processing facility, better union catalog and list of serials, storage center to be built for all libraries with ILL potential, and library education programs for public libraries.
DOES THE SYSTEM WORK?		Unknown. (This factor not covered by the proposal.)
SPECIAL FEATURES		Funding formula rewards counties that participate in a regional group (thus qualifying for more state aid).

CRITERIA OF EVALUATION	OHIO	PENNSYLVANIA
STATED PURPOSE	To organize library resources to give everyone equal access to enriched resources while maintaining the autonomy of each library.	To improve library service throughout the state.
TYPE OF LIBRARIES IN THE SYSTEM	Primarily public; school, academic, special, and institutional libraries are also included to some degree.	Primarily public, but academic libraries are also included.
SUBSYSTEMS INVOLVED	Not made entirely clear. Public libraries are in a single system, supplemented by individual libraries of the other types.	Thirty (30) library districts grouped around four (4) regional centers.
ADMINISTRATIVE STRUCTURE	Centralized under the State Library Board.	Hierarchical.
FUNDING	Not made entirely clear. For construction 55% must come from local funds, 45% can be federally funded.	Individual libraries are funded primarily through local taxes with assistance from the state.
SERVICES OFFERED BY THE SYSTEM	ILL, centralized processing, plus plans for increased interlibrary communication, establishment of regional and county systems and the development of a union list of serials.	Standard library services, including interlibrary loan.
DOES THE SYSTEM WORK?	Major changes are needed to rectify inequitable distribution of resources; many people in the state are as yet not served.	
SPECIAL FEATURES	Eventually plan to coordinate the resources of school, public, academic, state, institutional and special libraries throughout the state.	

CRITERIA OF EVALUATION	TEXAS	WASHINGTON
STATED PURPOSE	To bring together libraries in a strong cooperative system; to increase service to patrons while maintaining autonomy of individual libraries.	To expand and facilitate library operations and to share resources among all types of libraries.
TYPE OF LIBRARIES IN THE SYSTEM	Public only, other types of libraries may eventually be included.	Public, academic and special libraries.
SUBSYSTEMS INVOLVED	Ten (10) regional systems.	Six (6) district system libraries.
ADMINISTRATIVE STRUCTURE	Centralized under the Library and Historical Commission and the State Library.	One State Library
FUNDING	Funding comes from local, state and federal sources. For 1973: state - $1,400,000; federal - $333.000.	Funding is done through the state legislature.
SERVICES OFFERED BY THE SYSTEM	Standard library services, including ILL, AV and a union list of serials. Reciprocal borrowing is being investigated.	ILL, cataloging and resource directory. Catalog lists holdings of the state university, the state library, state four year colleges and community colleges.
DOES THE SYSTEM WORK?	Member libraries acknowledge increase in service due to the system but feel that obtaining money directly would be more effective.	The computerized cataloging system is working as expected, however the system will soon switch from a batch system to an on-line system.
SPECIAL FEATURES	It is hoped that legislation will be passed soon to allow the inclusion of special and academic libraries in the present public library system.	

CRITERIA OF EVALUATION

WISCONSIN

STATED PURPOSE	To present the varied library services in the state.
TYPE OF LIBRARIES IN THE SYSTEM	The State Library, state law library, state university and State Historical Society.
SUBSYSTEMS INVOLVED	Three hundred and forty-seven (347) public libraries, 357 special libraries, 499 school libraries and 75 academic libraries.
ADMINISTRATIVE STRUCTURE	Division for Library Services under the Wisconsin Department of Public Instruction.
FUNDING	Funding comes from the state legislature and LSCA.
SERVICES OFFERED BY THE SYSTEM	Standard library services, including ILL and reference.
DOES THE SYSTEM WORK?	
SPECIAL FEATURES	

APPENDIX 3

SUMMARY AND EVALUATION OF INDIVIDUAL STATE PLANS

Summary and Analysis of the Nineteenth Biennial Report of the Arkansas Library Commission.*

Act 193, Acts of Arkansas, 1935 created the Arkansas Library Commission which serves as the state library agency. The ALC is responsible for a statewide program of development and coordination of library services including the formation of library systems and the administration of state and federal aid to establish county and multi-county systems. The long range goals of the system, as expressed by the ALC, are to: strengthen the state agency so it may serve as a resource center for system libraries; improve book selection and acquisition policies; acquire material so that the goal of satisfying 60% of all incoming requests can be reached; and to secure funding to maintain the present rate of acquisitions (p.16). It is through this program of acquisitions and others that the state agency seeks to foster development of the library system.

There are 33 county and multi-county systems covering 72 of the 75 counties in the state. Composition of these systems ranges from 19 single-county systems to 2 seven-county systems. The Arkansas Library Commission is the head of the state system and serves as "an information center for all types of libraries in the state especially public libraries and school libraries" (p. 18).

The organization chart of the ALC shows the Department of Education to be the governing body, and has acted as such since 1971. However, the ALC retains all authority over the state library system, with the exception of final budget approval (which the Dept. of Education is responsible for). The Arkansas Library Commission is comprised of eight members and directs the actions of the Librarian and Executive Secretary, who in turn oversees the county and multi-county systems.

Funding for each unit in the system comes primarily from local sources. This is supplemented by state and federal funds. For fiscal year 1974 the public libraries were funded as such: local - $2,500,000; state - $500,000; and federal - $1,000,000 (pp. 68-9). Federal, state and local funds are channeled into areas to provide services and materials to disadvantaged people throughout Arkansas. Programs are designed by local librarians, subject to the approval of the local library board and the ALC (p. 32). And, while uncertainties of federal funding hamper some programs, Arkansas is proud to be "the only state in HEW Region VI showing steady increase in State Grants-in-Aid to public libraries since 1937" (p. 44).

Services offered through the system are sophisticated and varied. Special emphasis is given to multi-media programs, service to the handicapped, interlibrary cooperation in the purchase and sharing of special reference materials, and a union file of system materials. The union list was started in 1956 and now serves in the location of over one million volumes. Since 1957 the ALC has operated as an acquisitions and processing center for itself and 53 public libraries throughout the state.

*Little Rock, Arkansas. Arkansas Library Commission. 1975.

Through purchased and rented terminals (from LSCA III funds) the ALC and nine other libraries, in fiscal year 1975, gained access to computerized cataloging (Amigos IUC/OCLC).

Throughout the state counties have developed uniform policies and comparable services. Further goals of the system focus on building even more multi-county systems and extending the services already found in the larger county libraries. Although this report is subjective by its authorship it seems to present a realistic picture of a system that is functioning well at this time.

Summary and Analysis of the Arizona Long Range Program Revised and Extended 1976/1980*

The state library system of Arizona states eleven goals, three of which are pertinent to this study: to "offer total library service to all residents of Arizona through regional systems, sharing resources, coordination progress and strengthening the public libraries that serve as resource centers for multi-jurisdictional library service areas;" to "supply the informational needs of the residents of Arizona by means of library networks and coordinating the resources of school, public, academic and special libraries;" and to "develop cooperative library services in the State and the southwest" (p. 7). In general, all goals point toward meeting state informational needs and serving all special and disadvantaged groups.

The State Library, in a centralized system, is under the jurisdiction of the Department of Administration The Governor appoints the Director of the Department who in turn appoints the Assistant Director in charge of each division: Administration, Research Library, Library Extension Service, Library for the Blind and Physically Handicapped, State Archives and Records Management and Microfilming. Of the 69 incorporated cities or towns in Arizona, 58 have legally established municipal libraries. "The trend in Arizona is to make the libraries a department of the city organization...." (p. 3).

At present the system is made up primarily of public libraries, although the intention is to include every interested library in a state system soon in the future. Library resources are limited in Arizona so it is hoped that every potential source of information will eventually be tapped.

County systems include the unincorporated areas and municipal libraries have the option of joining the county system. At present 11 of the 14 counties have organized, functional county library systems with two more in active planning. There are also six Regional Library Systems corresponding to the six State Planning Regions.

Funding for the State public library system comes primarily from the state itself. In 1972/73 $1,000,000 of the system budget came from

*Phoenix, Arizona State Dept. of Library and Archives, 1975.

the state; $500,000 came from the federal government and a smaller percentage came from miscellaneous sources. Under the State Grants-in-Aid program "a basic grant will be given to a library acting as an area resource center for developing and coordinating library and information services to achieve more efficient utilization of area resources" (p. 12).

The Arizona state system is seeking to improve state library services through an environment of cooperation and coordination. Beyond present cooperative efforts much is planned for the near future. "An automation consultant will assist in developing network programs" (p. 10) and also plans are being made for "the development of data bank systems with terminals at each library that demonstrates a need" (p. 17). These aren't on-line data bases such as we are studying, but it is a step in the right direction.

Other services in existence or soon to be included are: the Library Extension Service, a statewide cooperative A.V. acquisition program, in-service training and workshops for all community libraries, reciprocal borrowing of unrestricted material where it is agreeable and CHAIN, the Channeled Arizona Information Network that handles interlibrary loans among all types of libraries.

As it exists the state library system seems to be functioning fairly well, though it hopes to greatly extend its services. The largest obstacle to the system is the demography of the state--one county has 127.1 people/square mile, another has 2.6 people/square mile. As a result library resources are very unequally distributed. There is also the problem of trying to best serve the large non-English speaking segments of the state.

Summary of Conclusions and Recommendations for Colorado

Summary of Conclusions

Conclusion: Type of Library

All types of libraries are not participating in the Statewide Reference Network, although patron users from different Libraries might be gaining access to the Network through the public Library. Lack of knowledge of the Service or the lack of easy access perhaps hinders use by some types of libraries.

Conclusion: Type of Patron

Inasmuch as patron status was reported in only 46 per cent of the transactions, no valid conclusion can be drawn concerning the actual status of patrons using the Statewide Reference Network.

Conclusion: Activity by Type of Request

The dialogue often necessary for satisfying a request for information or documentation is frequently eliminated by existing Network operations and procedures. As a result, the Statewide Reference Network has become

primarily an interlibrary loan system for document exchange, except for the reference services offered by the Bibliographical Center for Research.

Conclusion: Type of Channel

Aside from the courier service which is available only in the Central Colorado System, the channels most used by libraries to transmit a message in the request path are the telephone and TWX. The mail is most used in the response path. The telephone receives greatest use where toll charges are small or non-existent.

Conclusion: Activity by Originating Level

Most requests originate at the local level, but more varied types of requests originate at the SARC and CSL levels. Local libraries use the Network primarily for interlibrary loan of documents rather than for information transfer.

Conclusion: Intended Use

The value of intended use information in satisfying a request is not recognized by participating librarians.

Conclusion: Type of Remark

Time limitation was the main qualification contained in the remarks made on transactions, although no remarks of any kind were made on 58 per cent of the transactions, either because remarks were felt unnecessary or because they were thought to involve expense.

Conclusion: Response Time and Time Per Link

The total response time, over both request and response paths, is longest during the months of heaviest Network activity. Response time tends to be considerably longer when a request has to go to the state level.

Conclusion: Dependency of Libraries on the Network

Dependency of libraries on Network resources is much greater in some geographical areas than in others. Nearly all libraries are net borrowers, but no library is primarily a lending library.

Conclusion: Input/Output Analysis

The capability of some system libraries to fill the requests of their primary patrons is related both to the size of the library collections and the existence of finding lists.

Conclusion: Performance and Network Administration

Dissatisfaction with the performance of the Statewide Reference Network is directly related to the lack of administration at the SARC and state levels.

Conclusion: Cost

No valid or reliable cost analysis can be made due to lacking information of actual operational costs, units of reference service and expected and actualized benefits, all of which are necessary for cost benefit measurements.

Summary of Recommendations

Lack of adequate administration was concluded to be the major cause of Network inefficiency and ineffectiveness. Recommendations I-VII make suggestions for improvement of Network administration and are prerequisite to the more specific recommendations that follow.

I. The Colorado State Library should remain the central agency for administration of the Statewide Reference Network. It should accept responsibility for the planning and the design of the Network; it should delegate role responsibilities and specialities and, it should be responsible for implementing operations and continuous evaluation.

II. The Colorado State Library should identify a position within the organizational structure at the appropriate level for an administrator of the Statewide Reference Network.

III. A governing committee--other than the Colorado Council on Library Development--should be established to work closely with the administrator of the Statewide Reference Network in the guidance and direction of the Network's development and in the determination of policy. The group should represent Network participants in all types of libraries and from all levels of service.

IV. Objectives of the Statewide Reference Network should be established. Some agreed-upon measures of performance should be decided before planning and redesign are attempted.

V. The administrator of the Network, the governing committee, and the State Librarian should establish some division of Network functions by designating role responsibilities and role specialization. Eliminating duplicate functions would result in more time, money and effort for mutually beneficial improvements. Such a designation would not advocate authority for the local, system, or state level, but rather would allocate powers and responsibilites to those levels and libraries most competent to effectively and efficiently render particular Network service functions.

VI. A plan for developing and implementing the Statewide Reference Network according to its objectives should be constructed for the future. The plan should be one that takes into account the needs of growth and possibility of change and one that allows for the studying of alternatives and analyzing of preferences and for a choosing from preferred alternatives. Such a planned action would increase the probability of achieving a better future for the Network.

VII. Efforts should be made to standardize Network policies and procedures wherever this action would benefit Network users and improve operational performance and evaluation. This standardization would include such things as determining the kinds of information to be collected and at what points, developing uniform procedures for collecting and reporting data, and clarifying policies and procedures for using and maintaining the System. Standardization should not be considered a threat to autonomy; it is a means to better service and mutual tangible benefits.

VIII. A means of providing for the equitable participation of all types of libraries in the Network should be encouraged. Since public, school, and community college libraries are now the only users of the Network, a second Statewide Reference Center at the University of Colorado for academic and special libraries should be established and funded. Other efforts for equitable participation might require the redesign of Network operations to facilitate access for all types of libraries.

IX. An improved means of rapid and effective communication is needed. Present facilities cause unnecessary delays and poor service. Channels and hierarchy should be flexible enough for requests and responses to be made in the most efficient manner along an optimum path. It is suggested that requests for author-title items continue to be transmitted as they are now by telephone or mail to SARCs and by TWX and BIB. Subject requests for information or documents, however, require a different process because of the necessity for negotiation about a patron's need. This might better be accomplished at all levels by a more personal means of communication, for instance through telephone conversation.

Any system devised should mesh into the state-wide hierarchy and, conceivably, into larger regional, national and international networks. It should therefore possess interface capability and compatibility for all types of libraries at all levels of service. It should also provide for transmission of non-print materials, first within a system and later state-wide.

X. A regular program for education of library Network users should be undertaken through workshops, meetings or newsletters that advertise Network policies and procedures. Patron users and potential patrons should be informed of Network services by publicizing within as well as outside of libraries.

XI. A cost analysis should be conducted to determine actual costs and where inefficiencies occur. This would require an identification of costs and standardization of record-keeping.

XII. A funding procedure based partly on measures of participation should be devised to take into account the borrowing and lending of a particular library. It should be determined what the basic operating costs of a system are and the allocation of funds according to participation measures should be over and above the determined basic operating costs.

XIII. The Colorado State Library should assist in the development of adequate local and SARC collections. The linkage of libraries into system and state-wide cooperation can increase th strength and number of

access points of already adequate libraries. But reliance on Network strength as an alternative to satisfying primary patron needs could defeat the System's purposes. The Statewide Reference Network hierarchy can be viewed as a pyramidal structure with the State library at the apex and a system of strong local libraries as the foundation. Without the base of strength sufficiently represented by local libraries in primary functions and responsibilities, the structure cannot exist and is in danger of collapsing under the forces which it was meant to overcome.

XIV. A continual program of research for experimentation and evaluation should be established for maintaining and improving the System.

XV. The Statewide Reference Center operation at the Denver Public Library should be distinctly separated from the SARC operation for the Central Colorado System. The number of personnel is presently inadequate for two operations, and funds should be made available for a separation. This change would insure that neither group received priority or better service.

XVI. The Bibliographic Center for Research serves the Statewide Reference Network as its State Communications Center. It operates at the state level as the major switching center for relaying requests to other points on the Network, identifying locations for referring requests, and providing reference information needed for bibliographic verification. The Colorado State Library should decide whether it will continue to contract with BIB to perform these Network services or whether it will perform these functions another way. If the latter alternative is chosen, it should be remembered that such a choice would be very costly, would duplicate location files and services already in existence, and would require halting Network service while a new communications center could be established. If, however, the current BIB contract is continued, and BIB is delegated the Network switching center and reference functions, future contracts should state a required accountability for quality of service given and operations efficiency for fulfillment of the agreement. Consideration should be given to providing the adequate financial support to BIB for expanding and improving service, reducing costs and accomplishing the associated Network objectives.

XVII. The Colorado State Library should lead in devising and implementing a plan for state-wide bibliographical control that would facilitate the creation of a selective state-wide catalog, system area finding lists, and the location of subject strength and non-print resources, using as a base the holdings of the State Communications Center.

Profiles of the Public Library System in New York State (1966)

Public libraries in New York state are grouped into regional library systems consisting of one county in the case of highly populated areas or of a group of several counties in more rural areas. In most cases, libraries in the system have a contract with a central or district library which provides centralized book ordering and processing, inter-library loan services and, in some cases, professional consultation in formulation of policies, book selection, etc. Some systems have a board of trustees which is selected by all participating libraries. All systems have reciprocal borrowing privileges, in which a user of any of the participating libraries can use any other library free of charge.

"Factors Associated with Membership and Non-Membership in Public Library Networks in Illinois" by Ralph M. Slemstrom (Thesis, Graduate School of Library Science, University of Illinois)

Legislation enabling and funding a network of public library systems was signed into law in August, 1965. It was recommended that 21 subsystems be formed with the minimum size 4,000 square miles and minimum population 150,000. The system would be governed by a board of directors made up of members of local library boards. The library system would provide supplementary services to community libraries rather than direct services to the public. Its goal was to improve service by sharing resources, and also to provide for orderly and coordinated growth. The state would provide equalization payments to bring per capita income up to $1.50, provided libraries levied a tax of 0.6 mils on the equalized assessed valuation of the area served. The state would also provide support in the form of establishment grants (1 time only) based on the number of counties served, population grants based on population served, and area grants based on area served. Four Reference Centers were established to provide ILL and photocopying services.

Summary and Analysis of The Ohio Long Range Program for Improvement of Library Services: As Assisted by the Federal Library Services and Construction Act, 1972-1976.*

This program is more a basic, proposed system design and outline of system philosophy than a description of the existing system. As such it is critical of larger concepts but does not deal with specific libraries or specific programs such as joint collection building and interlibrary loan.

The stated goals of the program, based on the Ohio Library Development Plan (developed 1968, re-evaluated 1972) are "primarily concerned with organizing library resources in such a way that while preserving the independence of each library, the goal of equal access to enriched library resources can be achieved" (p. 18). To this end, along with a variety of duties, it is the responsibility of the State Library and the State Librarian to see to "the improvement of public library services and interlibrary cooperation" as well as to "encourage and assist the efforts of libraries and local governments to develop mutual and cooperative solutions to library service problems and to recommend to the Governor and to the General Assembly such changes in the law as will strengthen and improve library services and operations" (p. 9).

Throughout the program two somewhat conflicting ideals are presented. On the one hand is the desire for a more complex, far reaching state network headed by the State Library. On the other hand is the desire to maximize individual library integrity. "Library resources and services may be regarded as a statewide system, but it must be recognized that Ohio libraries constitute a complex of individual autonomous systems and subsystems" (p. 9).

*Columbus: The State Library of Ohio, 1972.

Although the relationships between the various types of libraries are never made explicit the State Library of Ohio plans to eventually coordinate the resources of school, public, academic, state, institutional and special libraries for improved services to all users of each library type. Non-public libraries will be considered for inclusion into the state library system; those included will be eligible for grants from the State Library for conducting approved activities, such as research (p. 22).

At present the libraries of Ohio include:

Public libraries - a total of 633 libraries, branches and bookmobiles. Each library system is governed by a local board of trustees which determines the objectives and goals of their own library system.

College and University libraries - representing a total book collection of 14,055,215. Each library is governed by its parent institution.

School library/Media center - there are 624 individual public school districts in Ohio. Long awaited legislation is finally transforming "classroom centers" into well organized library centers.

Institutional libraries - 229,000 volumes were reported in 40 of Ohio's 52 state supported institutions, ranging from mental hospitals to correctional facilities. Many of these libraries are poor collections of cast-offs from other libraries and few have full-time, professional staff.

Special libraries - there are 157 in Ohio. Collection and service are both determined by the parent institution.

The State Library Board (five members) is appointed by the State Board of Education (which has no further power over the Library System). The State Librarian answers to the Library Board, and department heads and head librarians of the system report directly to him/her.

The federal, state and local funding pattern is not made clear by this program for most instances. The total (state") expenditure for public libraries in 1970 was $49,642,333. "Ohio's system of public library finance, which is unique among the states, tends to strengthen the position and responsibility of public library trustees inasmuch as it removes some of the fiscal constraints under which public library boards in other state must operate" (p. 3). In the case of construction of a new library building the "library must match federal funds on a ratio of 55% local funds to 45% LSCA (Library Services and Construction Act) funds" (p. 28). The only part of the system for which a specific funding schedule is suggested is for Area Library Service Organizations. "ALSOs should be funded with State funds, and LSCA funds should be used for advancing those parts of the Ohio Library Development Plan which focus on responsibilities for assessing needs, developing appropriate service response, and interlibrary planning and cooperation" (p. 19).

While not mentioning specific cooperation programs, the program expresses the hope that each library would be able to glean something valuable in the line of service from a statewide network of various types of libraries. The keyword stressed over and over is cooperation. In addition the program hopes to "develop viable links with libraries outside Ohio." To facilitate this cooperative effort, "electronic and other forms of rapid communication and delivery and the use of facsimiles shall be incorporated in this program where feasible" (p. 31). No specific mention is made of system use of on-line data bases, but it might be assumed that at least OCLC is used. Other services of the system include plans to establish county and regional public library systems, increase interlibrary loan, a state-wide communications network, and development of union lists of materials.

One of the major problems of the State Library System as it exists is the uneven distribution of resources to public libraries. "60% of the books, 72% of the library staff and 73% of the tax income are in the libraries of only 9 counties" (p. 16). As mentioned above, institutional libraries are in poor shape. Special libraries fluctuate with the success of the parent organization. At present there are "some 2.6 million rural people whose access to library resources and services is limited. The 53 predominately rural counties upon which they depend are for the most part severly limited in resources" (p. 12). Obviously the statewide system is not as far reaching as it might be and many potential users have no library access at this time. Perhaps part of the problem lies in the fact that "varying perceptions" exist as to "the State Library and its functions, particularly in the area of state-local relationships and the inter-relationships of the several types of libraries" (p. 17). It would appear that at this point the state library system is more in need of operational definitions to help clear up the nebulous relationships of what could be an extensive and highly valuable system of public, academic, institutional and special libraries.

A Study and Recommendations of Library Districts for Pennsylvania. Institute of Public Administration, Penn. State University, 1962.

General Assembly Act 188 (1961) authorized a statewide integrated library system. The State Library was to serve as both the focal point of the whole system and as one of four regional centers, the other three being located in Philadelphia, Pittsburgh, and University Park. The act also provided for the creation of up to 30 district libraries to form the basis of the hierarchical pyramid, but left it up to the State Librarian to designate the boundaries of each district and the central library for each district.

Criteria used in establishing districts included population (both present and projected future population), and existing natural and political boundaries.

Criteria used to determine which library should be the district library included the library's existing collection, physical facilities, distance from major population centers, and amount of financial support received from the local community. It was found that more than half of

the libraries chosen did not meet standards established for district centers, but it was felt that state aid and local initiative would enable them to improve sufficiently to meet the established criteria.

Problems involved in administering the system included lack of consistency in record-keeping, differences in quality of collections, individualism and lack of desire to cooperate on the part of some librarians or communities, differences in population density, etc.

Some college or university libraries were designated as district centers, but given only half the amount of state aid recommended since it was recognized that they would not be able to provide all the services that other district centers could provide (e.g. Children's Services). Half of the state aid was given to the State Library since it would be providing the needed services.

Summary and Analysis of A Study of the Texas State Library System: Phase I Report: Analysis of the Governance and Operations of the System*

The Texas State Library System was created by the Library System Act of 1969 which provided for "...the establishment, operation and financing of a state library system consisting of a network of interrelated cooperating library systems designed to provide adequate library facilities and services to the public" (p. I-1). The stated purpose of this system is to "bring together libraries into a strong voluntary, cooperative, decentralized arrangement capable of raising service to patrons to a new high in the history of Texas libraries while still maintaining the individual authority and discretion of each library member" (Preface to Phase I Report).

The state system is made up of ten major library systems, each of which is headed by a Major Resource Center located in the largest city of each area. These were designated, in 1975, as: Abilene Major Resource System; Corpus Christi Area Library System; Northeast Texas Library System; Texas Panhandle Library System; Central Texas Library System; Trans Pecos Library System; Fort Worth Major Resource System; Houston Area Library System; Lubbock Area Library System; and San Antonio Major Resource System. Each MCR must serve a population of 200,000+ and cover an area of 4,000+ square miles. The State Library has a stated, legal responsibility to the MCRs, part of which entails preparing an annual plan for state public library development. The MCRs each shoulder the major responsibility for planning, organizing and directing services within their own system.

A six member Library and Historical Commission is appointed by the Governor and is directly above the State Librarian and Director. Under this office is the Assistant State Librarian and one level lower are the heads of the Archives Division, Blind and Physically Handicapped Division, Library Services and Development Division and Records Management Division. In addition, the Head of each MCR reports to the State Librarian and is required to submit annual reports. Other components of the library systems are the Area Libraries (serving a population of 25,000+) and the Community Libraries (serving a population of under 25,000).

*Austin, Texas: Public Administration Service. 1975.

At this point in time the State Library System is made up solely of public libraries. The System Act does not allow for the inclusion of special, academic and school libraries. However, legislation is pending to alter this situation since it is felt that these libraries would be a valuable addition to the system in the future.

Funding for the State System is both state and federal. In fiscal year 1976 a state appropriation was made of approximately $1,000,000. In addition $1,800,000 in federal money was allocated, subject to appropriation. Libraries at each level of the system must receive at least 50% of their support locally. 'The Systems Act provides a formula for the distribution of state funds to the Major Resource Systems: 25% is apportioned equally and the remaining 75% on a per capita basis according to the most recent decennial census after first having provided for the administrative expenses of the State Library" (p. III-12). Federal money is also distributed along this basic guideline. Since federal funding varies, the State Library submitted budgets for 1976 and 1977 of substantial increases, both of which were approved, marking the beginning of important state financial support.

Various services provided through the system include:

Collection building - this area has been fraught with discontent. Since Area Libraries are excluded from interlibrary lending many people feel that this defeats collection enrichment at this level. Further cooperative efforts must be explored.

A.V. programs - although relatively little has been done in this area to date, most view it as having tremendous potential and an obvious natural for cooperative efforts.

Union list of serials - found to be valuable for borrowing and weeding at all levels.

Interlibrary loan - increasingly important, a little slow in getting started, and full impact cannot be felt until complete funding is realized.

Reciprocal borrowing - has not been adopted by most MCR systems despite the attractiveness of this arrangement and the apparent success in other states. This aspect is being investigated further.

(This study makes no mention of the use of on-line data bases, in any capacity, within the state system.)

After one year of full funding, 80% of the libraries responding to the study said that the quality of library service had increased as a result of the system. However, many libraries felt that they could have put the money to more effective use directly, rather than filtering it down through the system. This is a continuing problem since initial conflict arose over this same issue of resource allocation and organizational relationships.

Obviously the concept of cooperation is not adequately understood. The Major Resource Centers complain of having their resources depleted by member libraries and member libraries complain that MCRs don't always provide sufficient planning and management. At the time of this study, legislation was being proposed to help rectify this situation.

The Washington Library Network's Computerized Bibliographic System. December 1975

The basic assumption behind the WLN is to provide the sharing of resources among all types of libraries. And also the economies of a centralized computer-communication to provide assistance for libraries internal function; boosting the power of libraries to respond to today's rapidly increasing information demands. This computer-communications system is designed with the potentiality to be broadened to a multi-state network, to be interfaced with or be emulated by other libraries' or states' computer systems and subsequently to become an integral part of national and international information networks.[1]

The State Library funded by the state legislature provides the administrative structure for this network. 120 member libraries of all types, academic and public libraries are mentioned specifically, and 6 district system libraries are in the network.

A complete MARC data base is offered by the system. Computer-printed lables for processing, records for films, monographs and serials, a machine-readable authority file, subject authority files, sorting by Library of Congress rules, and a Residual file are some of the services. A resource directory with regular volumes containing complete bibliographic records numbered sequentially in order of input to the computer and the indexes (author, title, and subject) volumes containing bibliographic information plus holdings and call numbers attached to each record is also provided.

So far the computerized cataloging system is working as expected. However, the WLN is anticipating a switch from a batch system to an on-line system.

Wisconsin Library Service Record 1975 State of Wisconsin, Department of Public Instruction - Barbara Thompson, Ph.D., State Superintendent, Division of Library Services - W. Lyle Eberhart, Administrator and Assistant Superintendent. Published by the Division for Library Services - Department of Public Instruction, 126 Langdon Street, Madison, Wisconsin 53702. August 1976.

The purpose of the Wisconsin Library Service Record 1975, is to present the varied library services in the state (public, academic, school, special and regional) and to show the cooperative efforts being made in the state to coordinate them for the benefit of library patrons. The Wisconsin Council on Library Development, the Council of Wisconsin Libraries, professional associations, and citizen committees have all been involved with coordinating efforts to make greater information services available throughout the state. In the state there are 347 public libraries, approximately 357 special libraries, 499 public school libraries, and 75 academic libraries.

The resources listed below are vital links in the planning process for Wisconsin's library networks.

[1]WLN Computerized Bibliographic System, p. 6.

The public libraries, the Instructional Television/Radio Broadcast and Cable Television system, the State Law Library, the State Library, and various bureaus of the University of Wisconsin-Bureau of Audio-Visual Instruction, Bureau of Reference and Loan Services, Cooperative Children's Book Center. Also the Legislative Reference Bureau, Special Education Materials Centers, Wisconsin Documents Deposit System, State Historical Society of Wisconsin, Northeast Wisconsin Intertype Library, Inc., and various councils set up to help coordinate efforts--Tri-County Library Council, Inc. (TLC), Madison Area Library Council, Library Council of Metropolitan Milwaukee (LCOMM), projects Coordinated Library Information Program (CLIP), set up under the Library Services Construction Act.

The nine former state universities in Wisconsin have been producing a computerized union list of periodicals for a number of years. The libraries rotate the editing and print-out of each revised edition. Copies are distributed to the nine participating libraries (Eau Claire, La Crosse, Oshkosh, Platteville, River Falls, Stevens Point, Stout, Superior and Whitewater) and to the Wisconsin Interlibrary Loan Service (WILS) office. Another cooperative effort of the former state universities is the Master's Theses and Seminar Papers-Former Wisconsin State Universities; 1935-1972. A catalog which came out in 1973 is University of Wisconsin System Video Tape Catalog. It contains the holdings of all former state university system libraries that wished to participate.

Tools produced to encourage resource sharing:

NEWIL (Northeast Wisconsin Intertype Libraries)
Union List of Periodical Holdings / Instructional Media Catalog NEWIL Post / Directory of NEWIL Libraries.

MALC (Madison Area Library Council:
Directory of Libraries and Information Centers in Dane County / Union List of Periodicals / Newspapers Currently Received in Dane County Collections / Directory of Staff Members of Libraries and Information Centers in Dane County / MALC Informer.

LCOMM (Library Council of Metropolitan Milwaukee)
Directory of Librariesand Information Centers in Southeastern Wisconsin (with TLC) / LCOMM News.

TLC (Tri-County Library Council)
Directory of Libraries and Information Centers in Southeastern Wisconsin (with LCOMM) / Tri-County Library Council News.

Additionally, there are numerous other union lists, and microfilmed holdings of the Libraries of the University of Wisconsin. The Council of Wisconsin Libraries (COWL) has produced or is currently exploring a number of resource sharing tools. In 1975 COWL published a Survey of Machine-Readable Bibliographic and Numerical Data Bases and Related Services of Wisconsin. This publication lists 59 data bases which are available in Wisconsin libraries, giving a description of each data base, the subject coverage, its availability, the year it began frequency of up-date, current size, the printed equivalent, the thesaurus used, search strategies,

and the person(s) to contact for additional information. Currently COWL is exploring the possibility of a statewide data base of serial holdings. Existing networks include the Wisconsin Health Science Library Networks, a portion of the nationwide Biomedical Communications Network. There is also a back-up provided with the Midwest Health Science Library Network and ultimately, the National Library of Medicine. There are also six health science library cooperatives or consortia. These include the Fox River Valley Area Library Cooperative, the Northern Wisconsin Health Science Library Cooperative, the South Central Wisconsin Health Planning Area Cooperative, the Southeastern Wisconsin Health Science Library Consortium, and the Western Wisconsin Consortium.

Another networking feature includes the Wisconsin Interlibrary Loan Service at the University of Wisconsin and the Milwaukee Public Library who installed teletype equipment at appropriate area headquarter libraries. During 1975, the TWX equipment was modified to permit teletype transmission via state leased DAIN (Dial Access Intercity Network) telephone lines. Three public library systems utilized TWX equipment and the Southeastern Wisconsin Union List to route selection interloan requests directly to Milwaukee Public Library.

This study is a compilation of state and regional networks, services and resources with proposals for expansion. At present, Wisconsin seems to have achieved organization and control over the resources available within the state, but not expanded their resources on a nationwide basis. The COWL committee has been looking into providing access to machine-readable bibliographic data bases, such as ERIC, CHEMCH, NY TIMES INFORMATION BANK, etc.

For our purposes this study is a good guide to the kind of research that must be done before a networking system can be proposed.

APPENDIX 4

54 C

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lis 300

voos3          9:34          05/03/77       tuesday

302 d 1852
312 t snake river echoes
322 1 none$hist abs
332 d 1971
342 t world affaris quarterly
352 1 njr*ndana$hist abs
362 d 1950
372 t zeitschrift fur pflanzenzuchtung
382 1 njr$ssci
392 d 1912
402 t rememberances of passaic county
412 1 none$hist abs
422 d n.d.
432 t osterreichisohe monatshefte
442 1 none$hist abs
452 d 1845
462 t boletin de la universidad de chile
472 1 none$hist abs
482 d 1959
492 t revista del instituto de estudios islanicos en madrid
502 1 none$hist abs
512 d n.d.
522 t bungei shunju
532 1 none$hist abs
542 d 1923
552 t present tense
562 1 none$hist abs
572 d 1973
582 t new zealand operational research
592 1 none$ssci
602 d 1973
612 t new review; a j. of eastern european history
622 1 c$hist abs
632 d 1961
642 t mississippi quarterly
652 1 none$hist abs
662 d 1947
672 t military medicine
682 1 njncm*njr$ssci
692 1 1891
702 t listy filologicke
712 1 none$hist abs
722 d 1874
732 t kriminalistik
742 1 none$ssci
```

APPENDIX 5

MILITARY MEDICINE	NJNCM	SSCI	1891
	NJR	SSCI	1891
MINN DEPT NATURAL RESOURCES DIV OF FISH AND WILDLIFE SEC OF WILDLIFE RESEARCH Q	NONE	BIO	N.D.
MISSISSIPPI QUARTERLY	NONE	HIST ABS	1947
MITTEILUNGSBLATT VERBAND DER BIBLIOTHEKA DES LANDES NORDRHEIN O-WESTFALEN	NONE	LISA	N.D.
MODERN LANGUAGES	NJR	LLBA	1905
MOLECULAR CRYSTALS AND LIQUID CRYSTALS	NJIT	SCI	1966
MOLECULAR CRYSTALS AND LIQUID CRYSTALS	NJR	SCI	1966
MONATSCHRIFT FUER KINDERHEILKUNDE	NJR	BIO	1902
NATIONAL ADVISORY SERVICE QUARTERLY REVIEW	NONE	BIO	N.D.
NATURE CANADA	J	BIO	1972
NATURE CANADA	KEAN	BIO	1972
NEOPLASMATA	NONE	PSY	1970
NEVROLOGIYA PSIKHIATRIYA I NEVROKHIRURGIYA	NONE	BIO	1962
NEW REVIEW A J. OF EASTERN EUROPEAN HISTORY	C	HIST ABS	1961
NEW YORK FISH AND GAME J.	KEAN	POLLU ABS	1954
NEW ZEALAND OPERATIONAL RESEARCH	NONE	SSCI	1973
NICHIDAI SOAKU ZASSHI	NONE	BIO	N.D.
NOGYO KISHO	NONE	BIO	N.D.
NORDIC HYDROLOGY	NONE	SCI	1970
NOVA GUINEA	NONE	BIO	1960
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER SPECIAL CIRCULAR	NONE	BIO	1967
OIKOS SCANDINAVICA	NONE	BIO	N.D.
OSTERREICHISCHE MONATSHEFTE	NONE	HIST ABS	1945
PACIFIC J. OF MATHEMATICS	G	SCI	1951
PACIFIC J. OF MATHEMATICS	M	SCI	1951
PACIFIC J. OF MATHEMATICS	NJIT	SCI	1951
PACIFIC J. OF MATHEMATICS	NJR	SCI	1951
PACIFIC J. OF MATHEMATICS	S	SCI	1951
PACIFIC J. OF MATHEMATICS	T	SCI	1951
PALESTINE J. OF BOTANY			

AIR PRODUCTS + CHEMICALS
1 POSSUMTOWN ROAD, PISCATAWAY, N.J. 08854

C.E. BLADES/J.P. EMLER 201-356-4040

BIOSIS (LOCKHD) CHEMCOM (LOCKHD) CLAIMS (LOCKHD)
COMPENDEX (LOCKHD) INFORM (LOCKHD)
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MEDLINE (NLM) MEDLINE (SUNY) MESH VOC
NAME AUTH SDILINE (NLM) SDILINE (SUNY)
SERLINE CBAC (TOXLINE/ELHILL2) TOXBIB (TOXLINE/ELHILL2)
IPA (TOXLINE/ELHILL2) HEEP (TOXLINE/ELHILL2)
HAPAB (TOXLINE/ELHILL2) HAYES (TOXLINE/ELHILL2)
CBAC (TOXLINE/ELHILL3) TOXBIB (TOXLINE/ELHILL3)
IPA (TOXLINE/ELHILL3) HEEP (TOXLINE/ELHILL3)
PESTAB (TOXLINE/ELHILL3)
ED+EJ ERIC THRU APR 75 (LOCKHD)
CHEMABS VOL 76-82 ISS 15 (LOCKHD)
EC ERIC 4TH QTR 1974 (LOCKHD)
NTIS 1964-1975 ISS 13 (LOCKHD)
SOC SCISEARCH 73-75 (LOCKHD)
ENGR. INDEX 70-75/APR. (LOCKHD)
AIM + ARM FILE 1975 (LOCKHD)
NAL/CAIN ISS APR 75 (LOCKHD)
PSYCH ABS 1967-1975/APR (LOCKHD)
INSPEC-PHYSICS 70-75 (LOCKHD) ABI DATA BASE (LOCKHD)
INSPEC-ELEC + COMPUT 70-75 ISS 9 (LOCKHD)
ISMEC-MECH ENGR 73-75 ISS 8(LOCKHD)
PATS CMA-EMA (LOCKHD) PATS PRT ABST WKLY (LOCKHD)
PATS P+S (LOCKHD) PATS SOURCE (LOCKHD)
PATS DOMESTIC STATISTICS (LOCKHD)
PATS EIS PLANT FILE (LOCKHD)
CLAIMS/CHEM 1950-1975 MAR (LOCKHD)
CLAIMS/GEN 1975 (LOCKHD)
BIOSIS PREVIEWS (LOCKHD)
APILIT (SDC) APIPAT (SDC) ASI (SDC) CAIN (SDC)
CHEMCON (SDC) CHEM7071 (SDC) CIS (SDC)
COMPENDEX (SDC) ERIC (SDC) GEO-REF (SDC)
IDC/LIBCON (SDC) INFORM (SDC) PATRIX (SDC)
NTIS (SDC) P/E NEWS (SDC) POLLUTION (SDC)
SEARCH (SDC) SSIE (SDC)
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RAPIDATA (NATIONAL BUREAU OF ECON-RESEARCH)
TL 735+

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CHEM 70/71 (SDC) ERIC (SDC) INFORM (SDC)
LIBCON (SDC) NTIS (SDC) SCISEARCH (SDC)
SSIE (SDC)
IBM 2741

0005

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INFORM (SDC) CHEMCON (SDC) CHEM 70/71 (SDC)
CAIN (SDC) NSI (SDC) CIS INDEX (SDC)
GEOREF (SDC) P/E NEWS (SDC) POLLUTION (SDC)
COMPENDEX (SDC) ERIC (SDC) NTIS (SDC)
CHEMCON (LOCKHD) NTIS (LOCKHD)
BIOSIS (LOCKHD) INSPEC (LOCKHD)
COMPENDEX (LOCKHD) CAIN (LOCKHD)
PREDICASTS (LOCKHD) INFORM (LOCKHD)
ERIC (LOCKHD) PSYCHOLOGICAL ABSTRACTS (LOCKHD)
CITATION INDEX (LOCKHD)
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NTIS (SDC)

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NTIS 1964-1975 TSS 15 (LOCKHD)

SOC SCISEARCH 75-79 WK21 (LOCKHD)
ENGR. INDEX 70-79/MAY (LOCKHD) AIM + AAM FILE 1979 (LOCKHD)
NAL/CAIN ISS JUN 79 (LOCKHD) PSYCH ABS 1967-79/JUN (LOCKHD)
INSPEC-PHYSICS 70-79 ISS 13 (LOCKHD)
INSPEC-ELEC + COMPUT 70-79 ISS 13 (LOCKHD)
ISMEC-MECH ENGR 73-79 ISS 13 (LOCKHD)
ABI DATA BASE (LOCKHD) PATS CHA-CHA (LOCKHD)
PATS MKT ABST MTLY (LOCKHD) PATS F+S (LOCKHD)
PATS SOURCE (LOCKHD) PATS DOMESTIC STATISTICS (LOCKHD)
PATS EIS PLANT FILE (LOCKHD)
CLAIMS/CHEM 1950-79 WAA (LOCKHD) CLAIMS/CHM 1979 (LOCKHD)
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NTIS (SDC) P/E NEWS (SDC) POLLUTION (SDC)
CHEM70I (SDC) CAIN (SDC) SCISEARCH (SDC)
SSIE (SDC) *DOLARS
WESTERN UNION DATA SERVICES CO. TERMINAL NO. 300+

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DERWENT-PLASTOC (IN HOUSE)
EC+EJ ERIC THRU APR75 (LOCKHD) CHEMABS VOL76-82 (LOCKHD)
EC ERIC 4TH QTR 1974 (LOCKHD) BIO ABST. 72-75 JULY (LOCKHD)
NTIS 1964-7> ISS 16 (LOCKHD) SDC SCI SEARCH 72-75 (LOCKHD)
ENGR. INDEX 70-75/MAY (LOCKHD) AIM+AAM FILE 1975 (LOCKHD)
NAL/CAIN ISS JUNE 75 (LOCKHD) PSYCH ABS 1967-75/JUN
(LOCKHD)
INSPEC-PHYSICS 70-75 ISS 13 (LOCKHD)
INSPEC-ELEC + COMPUT 70-75 ISS 13 (LOCKHD)
ABI DATA BASE (LOCKHD) PATS CHA-CHA (LOCKHD)
PATS MKT ABST MTLY (LOCKHD) PATS F+S (LOCKHD)
PATS SOURCE (LOCKHD) PATS DOMESTIC STATISTICS (LOCKHD)
PATS EIS PLANT FILE (LOCKHD)
CLAIMS/CHEM 1950-1975 WAA (LOCKHD) [illegible]

CLINICAL/LAB DEV DATA (LOCKHEED)
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CLEAR (COMPUTERIZED LITERATURE EVALUATION OF MICHE) (UNKNOWN)
RETRIEVE (ROCHE PRODUCT LITERATURE, ENGLISH LANG) (UNKNOWN)*
TELETYPE MODEL 33
TELETYPE MODEL 37
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INFORM (LOCKHD) CAIN (LOCKHD) INSPEC (LOCKHD)
PATS (LOCKHD) CLAIMS (LOCKHD)
CHEM70-71 (SDC) SSIE (SDC) POLLUTION (SDC)
MATRIX (SDC) LIBCON (LOCKHD)
TI SILENT 700 +

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COPPER DATA CENTER (BASIS)
COPPER DEVELOPMENT ASSOCIATION MARKET DATA (CYPHERNET)
GE TERMINET 300 + WESTERN UNION TELETYPE 33 +

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SDC*
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DIALOG (EXCEPT THOSE WHICH REQUIRE SUB) (LOCKHD)
CELANESE INTERNAL INFORMATION (INHOUSE)
DATAPOINT 1100 +

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NTIS (SDC, LMS) P/E NEWS (SDC)
POLLUTION (SDC) PREDICASTS (LMS)
CLAIMS (LMS) INSPEC (LMS)
TEXT. TECH. DIGEST (NCSTRC) WORLD TEXT. ABSTRACTS (NCSTRC)
TOXLINE (LEDERLE LIBRARY, AMERICAN CYANMID)
CHEMLINE (LEDERLE LIBRARY, AMERICAN CYANMID)
MEDLINE (LEDERLE LIBRARY, AMERICAN CYANMID)
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ERIC (SUNY) * BIO ABSTRACTS (SUNY) *
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SCISEARCH (SDC)
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NAL/CAIN (LOCKHD) PSYCH ABSTRACTS (LOCKHD)
TOXLINE MEDLINE

0024

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I. HAZNEDARI

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0025

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COMPENDEX (SDC) GEO-REF (SDC) NTIS (SDC)
SSIE (SDC) POLLUTION (SDC)
CAIN (LOCKHD) CHEMCON/CHEM7071 (LOCKHD)
COMPENDEX (LOCKHD) INSPEC (LOCKHD)
NTIS (LOCKHD) PSYCHCLCGICAL ABSTRACTS (LOCKHD)
BA PREVIEWS (LOCKHD)
TEXAS INSTRUMENTS SILENT 700/MODEL 725 +
TEXAS INSTRUMENTS SILENT 700/MODEL 733 WITH CIGI-LOG MODEL 33

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NTIS (LOCKHD) * CHEMICAL ABSTRACTS CONDENSATES (LOCKHD)*
COMPENDEX (LOCKHD) * ERIC (LOCKHD) *
PSYCH ABSTRACTS (LOCKHD) * ABI/INFORM (LOCKHD) *
NAL/CAIN (LOCKHD) * SSCI (LOCKHD) *
ASI (SDC) * CAIN (SDC) * CHEMCON (SDC) *
CHEM7071 (SDC) * CIS (SDC) * COMPENDEX (SDC) *
ERIC (SDC) * GEO-REF (SDC) * IDC/LIBCON (SDC) *
INFORM (SDC) * NTIS (SDC) * P/E NEWS (SDC)
POLLUTION (SDC) * SEARCH (SDC) * SSIE (SDC) *

0027

BEST FOODS RESEARCH CENTER, INFORMATION CENTER
BOX 1534 1120 COMMERCE AVE., UNION, N.J. 07083

LOUISE R. MORROW 201-688-9000 126

CAIN (SDC) CHEMCON (SDC) CHEM7071 (SDC)
COMPENDEX (SDC) ERIC (SDC) GEO-REF (SDC)

IDC/LIBCON (SDC) INFORM (SDC) MATRIX (SDC)
NTIS (SDC) POLLUTION (SDC) SCI/SEARCH (SDC)
SEARCH (SDC) SSIE (SDC) NITS (LOCKHD)
ERIC (LOCKHD) AIM/ARM (LOCKHD) CAIN (LOCKHD)
ABI (LOCKHD) INSPEC (LOCKHD) PSYCH. ABST. (LOCKHD)
COMPENDEX (LOCKHD) CHEMCON (LOCKHD)
SOC. SCISEARCH (LOCKHD) CLAIMS (LOCKHD)
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AIM/ARM (LOCKHD) EXCEPT. CHILDREN (LOCKHD)
PSYCH. ABST. (LOCKHD) POLLUTION ABST. (SDC)
GEO-REF (SDC) COMPENDEX (LOCKHD, SDC)
INSPEC (LOCKHD) ISMEC (LOCKHD) NITS (SDC.LOCKHD)
CA CONDENSATES (SDC,LOCKHD) MEDLINE (RUTGERS)
DDC (DDC) NASA (NASA)
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TI-735 +

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INTERNAL RESEARCH REPORTS FILE (INHOUSE)

C03C

ABI (LOCKHD)
ALLIED CHEMICAL CORPORATION, CORPORATE BUSINESS LIBRARY
0003 PAGE 2

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0028 PAGE 9

ABI DATA BASE (LOCKHD)
AMERICAN CYANAMID COMPANY, AGRICULTURAL DIVISION LIBRARY
0002 PAGE 1

HOFFMANN-LA ROCHE, INC., BUSINESS INFORMATION CENTER
0009 PAGE 3

UNION CARBIDE-CHEMICALS AND PLASTIC DIV.
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